" A STUDY ON ROLE OF PROSTATE SPECIFIC ANTIGEN IN CARCINOMA BREAST"

A DISSERTATION SUBMITTED TO

THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY

In partial fulfillment of the regulations for the award of the

M.S.DEGREE EXAMINATION

BRANCH I GENERAL SURGERY

DEPARTMENT OF GENERAL SURGERY

GOVT STANLEY MEDICAL COLLEGE AND HOSPITAL

THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY

CHENNAI

APRIL 2015

CERTIFICATE

This is to certify that the dissertation titled ***"A STUDY ON ROLE OF PROSTATE SPECIFIC ANTIGEN IN CARCINOMA BREAST"*** is the bonafide work done by ***Dr.K.R.DINESH ,*** Post Graduate student (2012 – 2015) in the Department of General Surgery, Government Stanley

Medical College and Hospital, Chennai under my direct guidance and supervision, in partial fulfillment of the regulations of The Tamil Nadu Dr. M.G.R Medical University, Chennai for the award of M.S., Degree (General Surgery) Branch - I, Examination to be held in April 2015.

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Place: Chennai.

Date: September 2014 **DR.K.R.DINESH**

ACKNOWLEDGEMENT

My sincere thanks to **Dr.AL.MEENAKSHISUNDARAM, MD., D.A.,**The Dean, Govt. Stanley Medical College for permitting me to conduct the study and use the resources of the College.I consider it a privilege to have done this study under the supervision of my beloved Professor and Head of the Department **Prof.Dr.S.VISWNATHAN,** who has been a source of constant inspiration and encouragement to accomplish this work.

I am highly indebted to my guide and Mentor **Prof.Dr.D.NAGARAJAN,** Professor of Surgery for his constant help, inspiration and valuable advice in preparing this dissertation.I express my deepest sense of thankfulness to my Assistant Professors **Dr.G.VENKATESH,**

Dr.S.JIM JEBAKUMAR, DR.MALARVIZHI for their valuable inputs

and constant encouragement without which this dissertation could not have been completed.I express my sincere gratitude to my guides **Prof. Dr. P.Darwin, Prof.Dr.J.Vijayan, Prof. Dr.K. Kamaraj**, former Heads of Department of General Surgery and my former Professor, **Prof.Dr.A.Rajendran**. I thank them for the constant support, able guidance, inspiring words and valuable help they rendered to me during my course.

I would like to thank my former Assistant Professors **Dr.P.Balaji, Dr.G.V.Manoharan, and Dr.M.Vignesh,** for their valuable suggestions and help in completing this dissertation.

I am particularly thankful to my friends Dr.Arshad Ali, Dr.kaushik kumar , Dr.Aravind Menon, Dr.Prasanna, Dr.Sakthi balan

Dr.Vinoth, Dr.Sukhdev, Dr.Madhuri without whom accomplishing this task would have been impossible.I thank my Seniors

Dr.Sudharsan, Dr.Naveen, Dr.Sivakumar, Dr.SaravanaKrushnaRaja, Dr.N.SangaraNarayanan, Dr.Gautham Krishnamurthy and Dr.Soundarya.G for their valuable support in this study.

I am extremely thankful to my patients who consented and

participated to make this study possible.

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INTRODUCTION

Breast cancer is one of a major challenge worldwide and is responsible for one of the highest causes of motality among females. Although there were tremendous improvement against breast cancer relieved by decreases in death rate since 1990 especially among women in the age group of 40-49, because of earlier diagnosis and better treatment, these progresses were insufficient and rate of survival is still unsatisfactory. Lots of researches are under trial in order to find a new biomarkers that might be better for diagnosis, prognosis, treatment, monitoring and to introduce new drugs that will act more effectively against breast cancer.

As we all know that prostate specific antigen is unique for prostate epithelium numerous studies have demonstrated that female tisse such as breast, endometrium, and ovary are also produce PSA which is similar to prostate.

since their differentiation and growth are under the control of steroid hormones and PSA is found to be secreted in breast milk of lactating mother and nipple aspirate. Mammary PSA having identical molecular weight and m RNA sequences of seminal PSA. PSA gene expression in breast malignancy found to be under hormonal control since steroid hormone receptor positive breast tumor cell lines T-47D and BT-474 are stimulated by glucocorticoids, mineralocorticoids, progestins and androgens, hence some amount PSA always will be Present in female serum in the range of 0.1-0.9 ng/lit. The aim of this study is to analyse the level of serum PSA level in patients with Carcinoma breast and to know its correlation with carcinoma breast.

AIMS & OBJECTIVES:

1.To know the usefulness of serum prostate specific antigen as a biomarker in carcinoma breast

2. To compare the level of serum prostate specific antigen in patients with carcinoma breast with normal standartised level and to compare the preoperative and postoperative serum PSA level in patients with carcinoma breast.

Breast cancer is the most common site specific cancer among women and is one of the leading cause of death due to cancer in the age group of 20 – 59 years. It cntribute for 26% of all newly diagnosed cancers among females and is sole reason for 15% of the cancer-related deaths in women

Breast cancer causes 5,19,000 deaths in a year worldwide, about 9,00,000 women are diagnosed each year. Incidence of breast cancer is 0.26/1,00,000 in males and 20.01/1,00,000 in females. While mortality associated with breast cancer is 1.20/1,00,000 in males and 4.32/1,00,000 in females. Mortality rates from breast cancer have increased during the past 60 years in every country reported that one in 22 women in India is likely to suffer from breast cancer during their life time.

In India incidence of breast cancer is raising on the higher side and pushing the cervical cancer to second place. In India one in every 22 women is likely to get breast cancer in their life time

The rise is being documented mainly in the metros but it can be safely said that many cases in rural India go unnoticed It is most often observed that due to lack of knowledge and ignorance, patients of carcinoma breast clinically present in a late stage of the disease.Breast cancer is a disease of the old age with the peak incidence in the fifth and sixth decades, but in India the disease is seen a decade earlier, probably because of shorter life expectancy in Indian women (about 65.3 years as per Indian data in 2005) as compared to counterparts in USA.

REVIEW OF LITERATURE

Dating back to 3000 – 2500 BC, the earliest known medical document known to man, the Edwin Smith Surgical Papyrus, mentioned that breast cancer had no treatment. In ancient Egypt, history of breast cancer treatment begins.

HISTORY

As far back as the time of Egyptian civilization,female Breast Carcinoma was the first tumour to be reported. Hippocrates,the father of modern medicine,advocated surgery as the only option to treat these patients. A prototype of radical mastectomy was performed during the time of Celsus.

LeDran(1685-1790) recognised the metastatic nature of the disease and suggested to remove the lymph nodes of primary and axillary groups in continuity.

The main modality of treatment over the past 80 years has been Surgical and almost all patients are subjected to surgery unless fit due to other reasons.Halstead of Baltimore made a detailed description of Radical Mastectomy in 1894. Due to recent advances in the field of medicine, various improvisations and modifications have been made. Breast Conservation Surgery and Auchincloss's Modified Radical Mastectomy have been integral part of the surgical management

EPIDEMIOLOGY

Presently, India already has one of the worst survivals from breast cancer, in the world .India has the highest number of women dying from breast cancer in the world; and India ranks number one in the numbers of healthy life years lost (DALY - Disability Adjusted Life Years) due to breast cancer.Since more patients (in India) turn up in later stages,they do not survive long irrespective of the best treatment they may get, and hence the mortality is fairly high

There are lots of reasons for late presentations including lack of awareness, shyness on part of patients, social stigma, ignorance of doctors (present on time, but doctors are not aware and they delay treatment) ,and many other causes.

EMBRYOLOGY

The human breasts develop from the mammary ridges or milk lines which result due to thickening of the epidermis which usually appear first on the ventral surface of a 5 week old fetus, which extends from the axilla to the upper medial region of the thigh. These ridges continue to develop in the pectoral region and the remaining ridges disappear. The epithelial cells proliferate, enlarge and grow downward into the underlying mesenchymal tissue. By the end of the fifth month of life Breast development starts as small cords. These cords continue to grow as downwards and branch, then slowly acquire lumina by hollowing in the last 8 weeks of the fetal life.

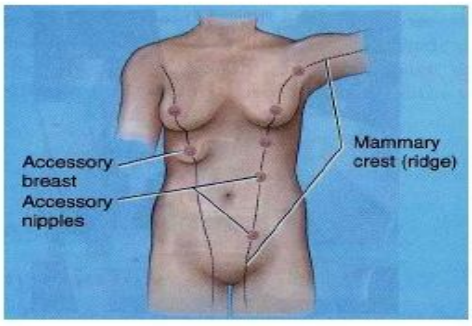


Fig 3 : Showing accessory breasts and the mammary crest.

The previously elevated flat surface of the developing nipple develops a depression (the mammary pit) into which these lactiferous ducts open. At about the time of birth the mammary pit evaginates outwards to form the definitive nipple as a result of proliferating mesenchyme. The earliest stages of fetal mammary gland development appear not to be dependent on steroid hormones, whereas the actual development of the breast structure after the 15th week is influenced primarily by oestrogen. In the last remaining weeks of gestation, the fetal breast is usually responsive to maternal and placental steroid hormones and prolactin, which induce secretory activity in fetal mammary ducts. This is manifested after birth by the secretion of colostrum and palpable enlargement of the breast bud. But due to disappearance of maternal hormones from infant's blood stream, the secretory activity subsides and ceases after birth within a month or two. The mammary gland shrinks and returns to an inactive state. In males mammary glands remain rudimentary throughout life but in most

females, further breast development does not begin until reaching puberty.

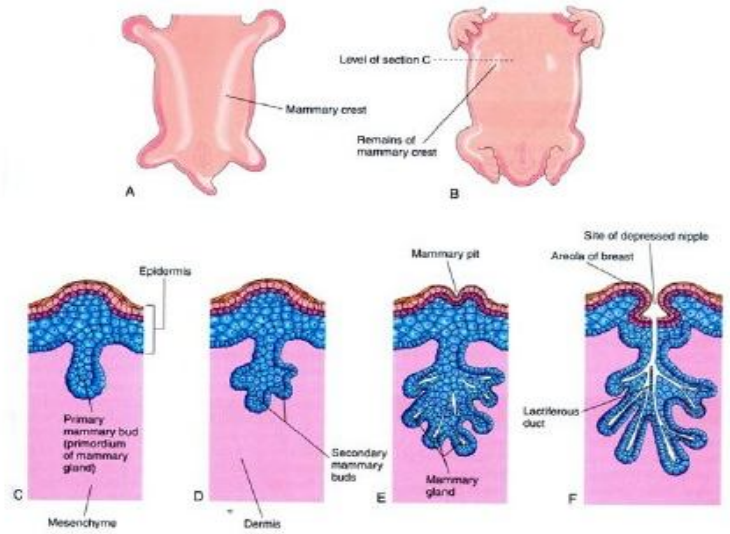


Fig 4 : Development of mammary glands.
A : 28 days embryo showing mammary crests. B : 6 weeks, showing remains of the crests. C, D, E, F : successive stages in the development between 12th week and birth.

Breast development commences with the onset of cyclical oestrogen and progesterone secretion at puberty. Oestrogen is responsible for the differentiation of peri-ductal stroma and growth of the ducts that elongate and acquire a thickened epithelium. Growth hormone and gluco-corticoids also contribute to ductal growth. Lobules are derived from solid masses of cells that form at the end of terminal ducts. Lobulo-alveolar differentiation and growth during this period are enhanced primarily by insulin, progesterone and growth hormone. Though the greatest amount of breast glandular differentiation occurs during puberty, the process continues into the second decade and is further enhanced by pregnancy. The evolution of breast from childhood to maturity has been divided into five phases by Tanner 10.

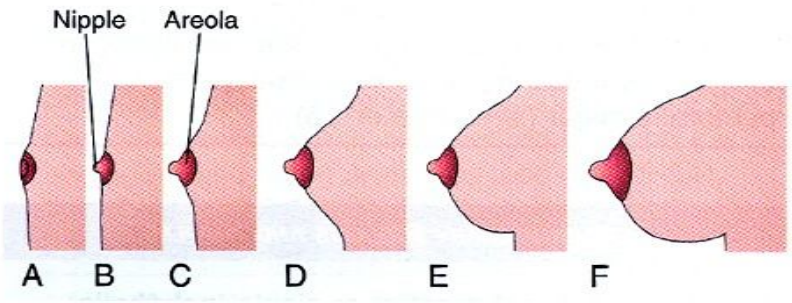


Fig 4 :Sketches showing progressive stages in the postnatal development of the breasts. A-Newborn. B-Child. C-Early puberty. D-Late puberty. E- Young adult. F-Pregnant female.

Phase I (age: puberty) : Preadolescent elevation of the nipple with no palpable glandular tissue or aerolar pigmentation.

Phase II (age: 11.1 ± 1.1 yr) : Presence of glandular tissue in the subareolar region. The nipple and breast project as a single mound from the chest wall.

Phase III (age: 12.2 ± 1.09 yr) : Increase in the amount of readily palpable glandular tissue with enlargement of the breast and increased diameter and pigmentation of the areola. The contour of the breast and nipple remains in a single plane.

Phase IV (age: 13.1 ± 1.15 yr) : Enlargement of the areola and increased areola pigmentation. The nipple and areola form a secondary mound above the level of the breast.

Phase V (age: 15.3 ± 1.7 yr) : Final adolescent development of a smooth breast

ANATOMY

The breast: basic structure and function

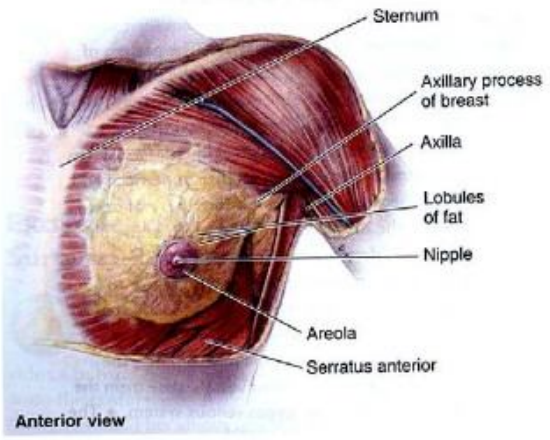


Fig 6 : Superficial dissection of female breast

The breast is a specialized modified sweat gland. The breasts consist of glandular and supporting fibrous tissue embedded within fatty matrix, together with blood vessels, nerves, and lymph vessels. The mammary glands are in the subcutaneous tissue overlying the pectoralis major and minor muscles. At the greatest prominence of the breast is the nipple , surrounded by a circular pigmented area, the areola. A small part of the breast extend into inferolateral edge of the pectoralis major towards the axilla which is called axillary tail of spense.

Structure: The breast is made up of 15-20 lobules of glandular tissue embedded in fat; the latter accounts for its smooth contour and most of its bulk. These lobules are separated by fibrous septa running from the subcutaneous tissue to the fascia of the chest wall (the suspensory ligaments of Cooper).

Each lobule drains by its lactiferous duct on to the nipple, which is surrounded by pigmented areola. This area is lubricated by the areolar glands of Montgomery; these are large, modified sebaceous glands which may form sebaceous cysts which may, in turn, become infected.

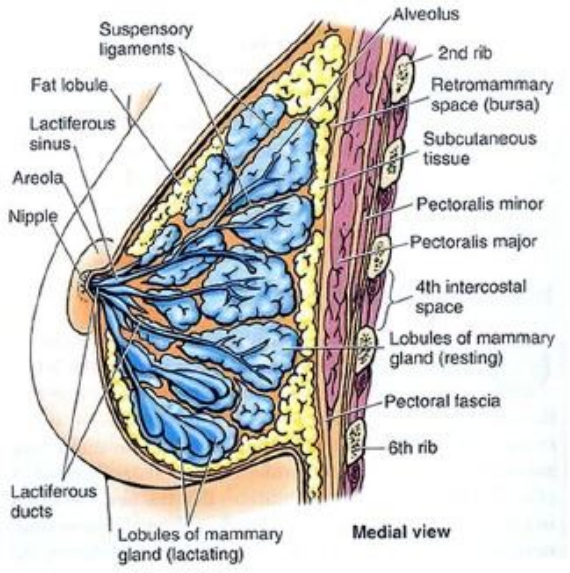


Fig 7: Sagittal section of the female breast and anterior thoracic wall.

Anatomical extent

- Lateral border of sternum to mid-axillary line
- Second to sixth rib

Breast is located between the superficial and deep layers of superficial fascia Retromammary space is a thin layer of looseareolar tissue between the deep layer of superficial fascia and deep fascia covering pectoralis major12. The breast can develop anywhere along the milk line, thus giving rise to accessory breasts or nipples.

Arterial supply

Lateral thoracic artery (main supply)

Internal thoracic artery

Posterior intercostal arteries

Pectoral branches of thoraco-acromial artery

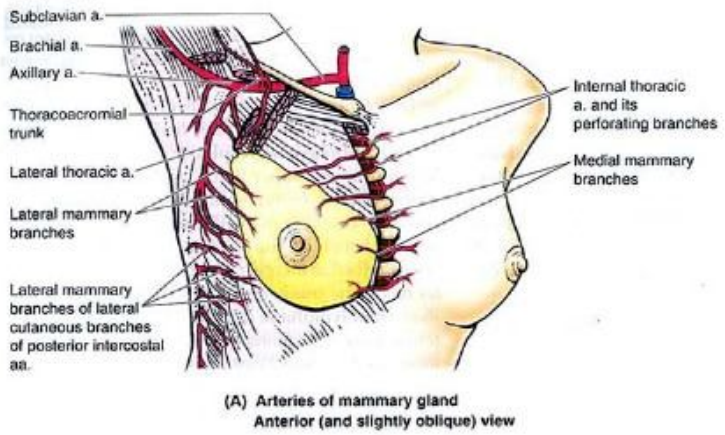


Fig 8 : Arterial supply of the mammary gland.

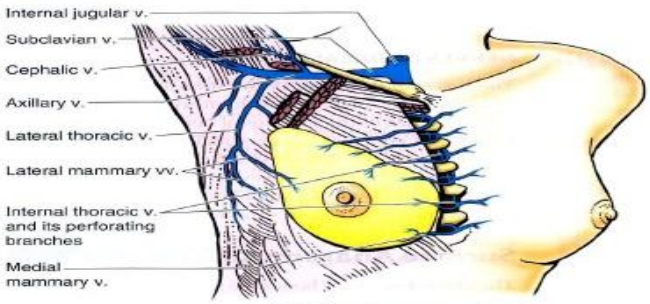
The venous return of the breast has both a superficial and deep system. Superficial veins of the breast are located just posterior to the superficial layer of the superficial fascia and can be seen by infrared photography. Around the nipple these veins form an anastomotic circle - the circulus venous. The deep veins and veins of the superficial plexus can be classified into 3 principal groups as follows :

i) Internal mammary vein

ii) Tributaries of the axillary vein

iii) Posterior intercostal veins

This system lies in direct continuity with the vertebral plexus of veins



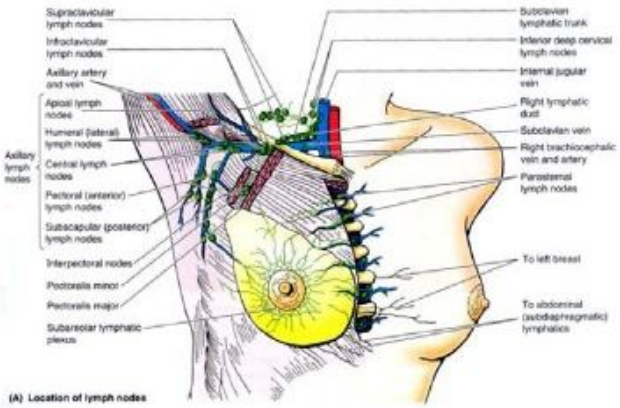
(C) Veins of mammary gland
Anterior (and slightly oblique) view

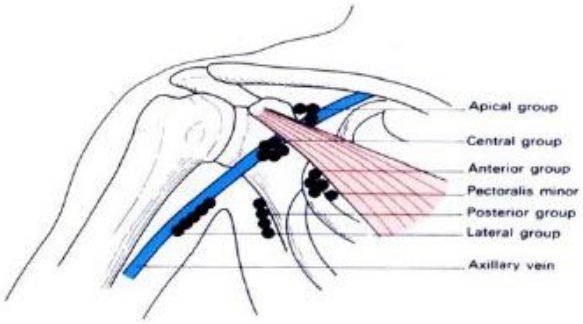
Lymphatic Drainage of the Breast :

Lymph Glands - Three routes for mammary lymphatic drainage have been identified:

Axillary Nodes are the most important and receives 75% or more of lymphatic flow. These range from 20 to 40 in number and have been classified by anatomists by their relationship to axillary structures in various groups as follows :

1. Lateral group also called axillary vein group
2. External mammary group[anterior or pectoral group]
3. Posterior [subscapular group]
4. Central group
5. Apical group
6. Interpectoral or Rotter's group





Axillary lymph nodes

LYMPHATICS
BERG'S LEVELS

LEVEL1	• Below&lateral To PM. • Anterior,lateral,posterior.
LEVEL2	• Behind the PM. • Central.
LEVEL3	• Above&Medial to PM. • Apical

Internal Mammary Lymph nodes (around 8-10 nodes) :

Lymphatics from the medial edge of the breast pierce the pectoralis major and intercostal muscles to reach the internal thoracic mammary lymph nodes - located along the sternal border of the internal thoracic trunk. This group accounts for 25% or less of lymph flow from the breast. The internal thoracic trunks drain into right lymphatic duct or thoracic duct.

These lymph nodes cannot be palpated, rather they are percussed or detected by imaging studies.

III. Posterior Intercostal lymph nodes - The third and least important route for lymphatic drainage is via the posterior intercostal lymphatics to posterior intercostals lymph nodes where the ribs and vertebrae articulate. There is enough evidence that lymphatic drainage from any given region is not lymph node metastasis with the location of primary tumors in the breast suggests that preferential pattern of lymphatic flow does exist in the breast.

B. Lymphatic Vessels

a) There are few channels which drain the overlying skin excluding nipple and areola.

The integumental lymphatics pass in a fan like radial manner and drain into surrounding lymph nodes. Lymphatic trunks from skin drain a separate portion and there is no communication between adjacent territories.

i) From the outer part – terminate at the axillary group of lymph nodes.

ii) The skin of upper part – drained by vessels which enter into the supra- clavicular lymph nodes.

iii) The skin over the inner part of gland – drain into internal mammary chain of lymph nodes.

The cutaneous lymphatic channels communicate across the midline with those of opposite breast.

internal mammary chain but a small amount may pass to the posterior inter-costal

glands lying near the heads of the ribs.

ii) Lymphatics from the deep surface of the breast pass through the pectoralis major on their way to the axillary or internal mammary glands.

iv) The plexus of deep fascia consists of fine lymphatic vessels. They do not act as a normal pathway for lymph from the breast to the regional nodes. Fine lymphatics connect the right and left internal mammary chains behind the manubrium sterni and small glands may be found there.

Breast Quadrants :

Breast is divided into four quadrant for purpse of anatomical description and tumor/cyst location

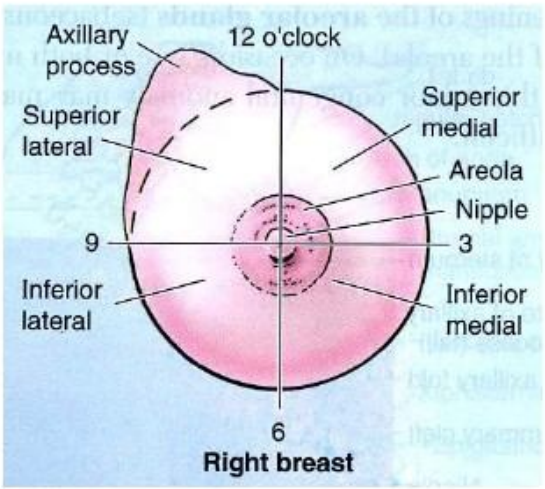


Fig 11 : Quadrants of the breast

PHYSIOLOGY OF BREAST

The morphology of the secretory portion of the mammary gland varies significantly with patient age and has physiologic and anatomic variance with pregnancy and lactation. The glandular component of the breast is sparse in the inactive (nonpregnant) premenopausal gland and consists predominantly of duct elements. The inactive organ undergoes slight cyclical changes throughout the menstrual cycle.

During pregnancy, the mammary glands undergo dramatic proliferation via cellular hypertrophy, lactation, and development. These events are accompanied by relative diminution in the volume of connective and adipose tissue.. It is covered thereafter with keratinized, stratifie squamous epithelium.

The areola contains sebaceous glands, sweat glands, and accessory areolar glands of Montgomery, which are intermediate between true mammary glands and sweat glands in their structure. These accessory areolar glands present as small elevations on the surface of the areola. Sebaceous and sweat glands are distributed along the margin of the areola. The tip of the nipple contains numerous free sensory nerve endings and Meissner (tactile) corpuscles in the dermal papillae,

whereas the areola contains few of these terminal sensory

structures. Neuronal plexuses are also present around hair follicles in the skin peripheral to the areola; Pacinian (pressure) corpuscles are present in the dermis and in the glandular tissue. The rich sensory innervation of the breast is of great functional significance in lactation.

RISK FACTORS OF CARCINOMA BREAST

Such risk factors for carcinoma breast can be classified into the following:

Major risk factors

Gender: more common in womens when compared to men

Although any breast lump seen in men is almost always malignant.

Age: The incidence of breast cancer is seen to increase with age. Up to the age of 40, the increase rate is very steep; the rate of increase then slows dramatically, although the overall cancer rate continues to rise until old age.

Previous history of breast cancer: previus history of breast cancer play Development second or non-synchrnous cancer a major role

Family history and genetic predisposition: family history of breast cancer increased the Incidence of cancer among first degree relatives. 5-10% breast cancers associate with BRCA1 and BRCA 2 germline mutation

Benign breast disease: long standing benign disease and previous benign diseases can

Intermediate risk factors :

Diet and alcohol intake: High saturated fat intake is said to increase serum estrogen levels.

Hormonal factor: hormones plays a major role in development of breast cancer, especially Oestrogen. Early menarche and late menopause has high risk of developing breast cancer

Due to prolonged exposure to oestrgen. Hormonal replacement theraphy for more than 10 yrs Increase the incidence of breast cancer.

Radiation exposure: radiation exposure raises the risk of breast cancer

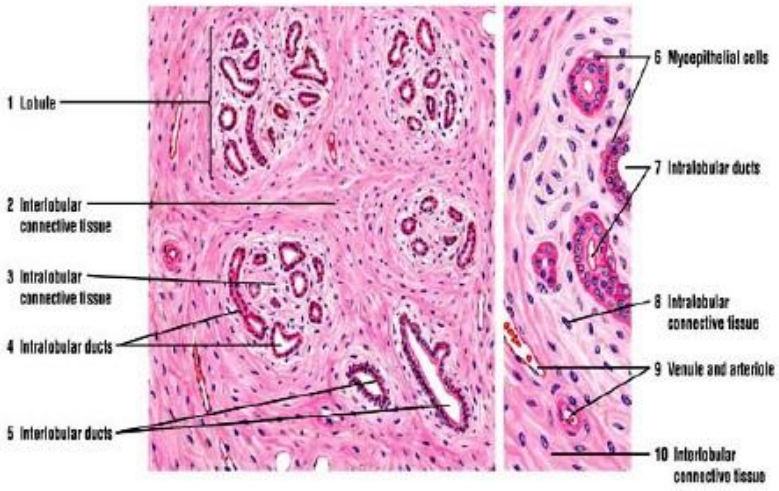
HISTOPATHOLOGY OF BREAST CANCER

scirrhous - means woody, medullary - means brain

like). More recently, histological descriptions have been used.

Breast cancer may arise anywhere along the milk line from the

Epithelium of the duct system anywhere from the nipple end of major lactiferous ducts to the terminal duct unit, which is in the breast lobule. Previously, descriptive terms were used to classify breast cancer (



Stain: hematoxylin and eosin, left side, medium magnification and right side, High magnification.

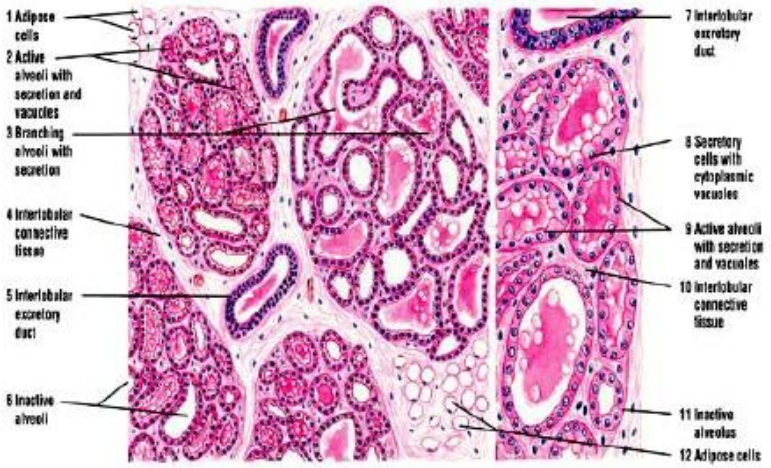


Fig 14 :Mammary gland during lactation.
Stain: hematoxylin and eosin. Left side, medium magnification and right side, high

- Non-invasive Epithelial Cancers :

Lobular carcinoma in situ (LCIS)

Ductal carcinoma in situ (DCIS) or intraductal carcinoma

- Invasive Epithelial Cancers :

Invasive lobular carcinoma (10-15%)

Invasive ductal carcinoma (50-70%)

Tubular carcinoma (2-3%)

Mucinous or colloid carcinoma (2-3%)

Medullary carcinoma (5%)

Invasive cribriform (1-3%)

Invasive papillary (1-2%)

Adenoid cystic and metaplastic carcinoma[2%]

Mixed Connective and Epithelial Tumors :

Cystosarcoma Phyllodes, benign and malignant carcinosarcomas and angiosarcomas.

Non-Invasive Epithelial cancers: Non-invasive neoplasms are broadly divided into

two major types: LCIS and DCIS (or Intraductal carcinoma).

Salient characteristics of In situ Ductal (DCIS) and Lobular (LCIS) carcinoma

	Lobular carcinoma in situ	Ductal carcinoma in situ
Age (years)	44-47	54-58
Incidence	2-5%	5-10%
Clinical signs	None	Mass, nipple discharge
Mammographic signs	None	Micro-calcifications
Synchronous carcinoma	5%	2-46%
Multicentricity	60-90%	40-80%
Bilaterality	50-70%	10-20%
Subsequent carcinomas: Incidence	25-35%	25-70%
Axillary metastases	1%	1-2%

LCIS develops from terminal duct lobular units

distension and distortion of terminal duct lobular units by cancer cells is the characterstic features. Predominantly seen in premenopausal womens

charecerised by multifocal and bilateral disease, clinically it does not produce lump.

DCIS is predominantly seen in female breasts (95%) and also in male Breasts, 5%). It consists of comedo,intermediate, non-comedo. Non – Comedo consists of solid, Cribriform and papillary types. It is intraductal carcinoma. No basal membrane involvement

DIAGNOSING BREAST CANCER

Clinical presentation

60% of breast cancer develops in upper and outer quadrant, due to increased amount of breast tissues

This is followed by tumours in the upper inner quadrant and beneath the nipple while lower half of the breast accounts for the rest.

Symptoms caused locally by tumor Lump:33% womens who having brest cancer develops lump and herelf noticed lump While doing household works or during take bath.

Pain: Pain is an uncommon symptom, except for vague pricking sensation in the

Breast pain is often suggestive of a benign condition. If present it suggests aggressive type of malignancy.

Nipple retraction: Usually present in later part of the disease process. Recent onset of nipple retraction in an elderly female patient is highly suggestive of malignancy.

Nipple discharge: Present in 3-11% of cases, blood stained discharge usually

indicates a intraductal carcinoma, Paget's disease or the tumor has grown into a major duct.

Nipple erosion: It is the commonest mode of presentation in Paget's disease, also seen in advanced intraductal carcinomas.

When there is local advancement of diseases, chest wall fixity, skin involvement like paeud orange appearances, ulceration develops.

This is described as cancer-encuirasse. About 20% of breast cancers in developing countries present in locally advanced stage.

Symptoms caused due to metastases :

Lymphatic spread: Patients may present with swelling in the axilla or supraclavicular region, which may be mobile or fixed. Swelling of arm due to lymphatic (or even venous] obstruction in the axilla, is an uncommon but significant presentation.

Hematogenous spread: Respiratory symptoms like cough, breathlessness due to pulmonary metastases. Backache, caused by secondary infiltration and collapse of

lumbar vertebrae, with nerve root pains radiating to both the legs, is a common symptom. A pathological fracture may be the first indication of the presence of the disease due bone metastases. Cerebral metastases may cause a fits or behavioral abnormality. Mass in the right upper abdomen, jaundice may be caused due to liver metastases. Curiously, the general symptoms commonly associated with cancer, such as malaise, weight loss and cachexia, are rare in patients with breast cancer. Even those with disseminated fatal disease usually feel well in themselves until the final stages.

CLINICAL EXAMINATION :

The patient must be fully undressed to the waist, resting comfortably on an examination couch with her upper body raised at 45 degree to the legs. This position is the best compromise between lying flat sideways, and sitting upright, which makes the breast pendulous. Patients sometimes say that their lump can only be felt when they adopt a certain posture and they should therefore be examined in this position as

Inspection: The surgeon inspects the women’s breast in following positions:

1. Arms by the side.

2. Arms straight up in the air and

3. Hands on her hips.

The following observations are made

Breast Position: whether displaced in any direction

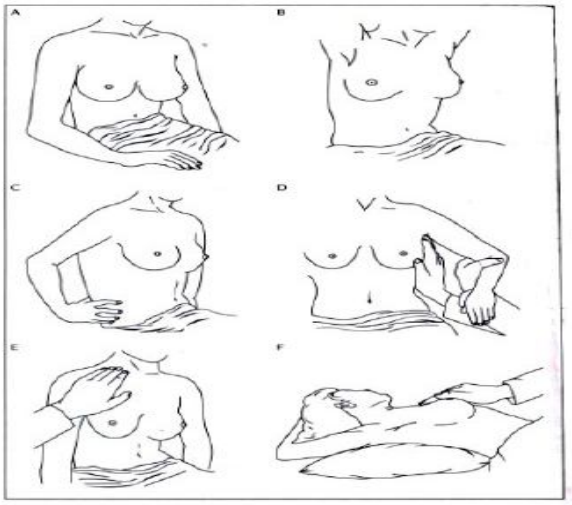
Symmetry: Marked size difference of recent onset is likely to be caused by significant pathology

Skin: The skin may be pulled in or puckered by an underlying cancer. There may be edema caused by obstruction of skin lymphatics by cancer cells, which is commonly referred to as peau d' orange. Other skin changes include nodules of tumor or a malignant ulcer due to direct invasion of skin by cancer.

Nipple and areola: The levels of nipples on both the sides are compared. In case of carcinoma the affected side is drawn towards the lump. Look for flattening, retraction, cracks, fissures or eczema. Any discharge from nipple and nature of discharge is

noted. Diminution in size of areola around a retracted nipple is a feature of malignancy. Skin changes may become prominent by making patient to raise her hands above her head. By asking to press the hands against the hips previously invisible swelling may become prominent. Inspect the axilla, arms and supraclavicular fossa to look for enlarged glands, distended veins or arm lymphoedema.

Palpation: The breast should be palpated with the flat of the fingers and not with the palm of the hand. Surgical mythology says that the breast should be felt with 'the flat of the hand'-this is wrong, use the fingers, which is more sensitive. With the patient sitting up at 45 degree, begin with the normal side first and then palpate the other. The commonest palpatory finding is a hard lump. It is felt most commonly in the outer upper quadrant, which may be irregular in shape and size. There is difference between skin fixation and tethering, when a lesion is fixed to the skin it has spread into the skin



cannot be moved or separated from it. Tethered lesions are more deeply situated and by distorting the fibrous septa which separate the lobules of breast tissue (the ligaments of Cooper), puckers and pulls the skin inwards, but remain separate from the skin and can be moved independently. Ascertain the mobility of the lump within the breast tissue and with relationship to pectoralis major muscle, this may be done by asking the patient to press against her hips. Also look for fixity to chest wall. If there is nipple inversion it may be possible to evert it by gently squeezing, if the nipple will not evert, there is likely to be underlying disease. Unilateral inversion is more significant than bilateral inversion.

Discharge may be gently expressed out and the character of the fluid noted.

Lymph nodes palpation: The axillary lymph glands form a three-sided pyramid whose apex is in the narrow gap between the first rib and axillary vessels. The examination is carried out in sitting position with muscles and fascia around the axilla well relaxed. If the patient's left axilla is to be examined, the left arm is taken and supported palpation should be done with examiner right hand to examine the anterior fold of axilla for pectoral lymph nodes

The hand is gently introduced gently into the apex of the axilla to palpate the apical lymph nodes, and passed down to palpate the central group over the medial wall of axilla.

The posterior and lateral groups can more easily be felt from behind. The posterior wall of axilla the scapular groups of nodes are felt around the serratus anterior and latissimus dorsi and lastly feel for the lateral group around the neck and shaft of humerus. The size, number, consistency and mobility must be fully documented. Obstruction of lymphatics may give rise to edema of the arm. Other groups of nodes that must be examined are the supraclavicular and infraclavicular nodes. Note particularly the presence of scalene node behind the insertion of sternocleidomastoid.

Triple assessment:

1) History and examination;
2) Diagnostic imaging by mammography or ultrasonography and
3) Cytology or histology. Sensitivity ranges from 85% to 95%.

BREAST CANCER STAGING

The American Joint Committee on Cancer (AJCC) staging system groups patients into 4 stages according to the TNM system, which is based on

Tumor size (T)

lymph node status [N]

and distant metastasis (M).

Primary Tumour(T)

Tumor size definitions are as follows:

- Tx – cannot be assessed
- T0 – No tumor
- Tis – DCIS
- Tis – LCIS
- Tis – Paget disease , no tumor
- T1 – Tumor ≤2 cm

- T2 – 2-5cm
- T3 – >5 cm
- T4 – Tumor any size + extention
- T4a- Chest wall (not pectoralis)
- T4b- Skin
- T4c – Both T4a and T4b
- T4d – Inflammatory disease

Clinical regional lymph node definitions are as follows:

- Nx –cannot be assessed
- N0 – No node
- N1 – Mobile ipsilateral axillary lymph node(s)
- N2 –

N2a – Ipsilateral **fixed** or matted **axillary** node(s)

N2b – Ipsilateral **internal mammary** nodes ONLY

N3 –

N3a – Ipsilateral **infraclavicular** lymph node(s)

N3b – Ipsilateral **internal mammary** lymph node(s) AND **axillary** lymph node(s)

N3c – Ipsilateral **supraclavicular** lymph node(s)

Metastases are defined as follows:

- Mx – cannot be assessed
- M0 – None
- M1 – Distant metastases

STAGING

- Stage I – T1N0M0

- Stage IIa- T0***N1***M0

  - T1***N1***M0

  - T2N0M0

  IIb- T2***N1***M0

  - T3N0M0

- Stage IIIa-T3N1M0

  -T0***N2***M0

  -T1***N2***M0

  -T2***N2***M0

-T3***N2***M0

IIIb-***T4***N0M0

-***T4***N1M0

-***T4***N2M0

IIIc-anyT**,** ***N3***M0

- Stage IV -anyT, anyN, ***M1***

GRADING

DESCRIPTION	**STAGE**
In Situ Breast Cancer	**Stage 0**
Early Invasive Breast Cancer	**Stage I,IIA,IIB**
Advanced LocoRegional Breast Cancer	**Stage IIIA or IIIB**
Metastatic Breast Cancer	**Stage IV**

MANAGEMENT OF BREAST CANCER

INVESTIGATIONS

Breast biopsy;

1. FNAC – Least invasive , least expensive and op procedure
2. Core biopst- can be done on palpable mass with tissue such as automated biopsy guns which has replaced aspiration cytology

Advantages :

a. Produces excellent histological detail rather than cytological specimen.

b. In situ cancers can be differentiated from invasive cancers.

c. Grading of tumors is possible.

d. Identification of estrogen receptors is also possible.

3. Open surgical biopsy: Biopsy is required when FNAC or core biopsies have failed to demonstrate malignant disease.

4. Open surgical biopsy and frozen section: when FNAC fails on table frozen section

5. Incisional biopsy: For cases presenting with an ulcer this method was used. not used routinely and has been replaced by FNAC.

Ultrasonography of breast

Most procedures are done using hand held 7.5 MHz to 10 MHz probes with a penetration depth of 4 to 6 cm

Benign lesions are characterized by smooth, well-defined margins, and homo genous internal echo pattern, symmetric posterior enhancement compressibility. Suspicious lesions show irregular, fuzzy or jagged margins, irregular internal shadow, posterior shadowing and show no comresibilty

Indications

Breast ultrasound can be primarily used to distinguish between solid and cystic lesions with an accuracy of 96% to 100%.

Ultrasound is the first choice for evaluating mammographically benign appearing lesions.

Pregnant women having suspicious lesions.

Ultrasound is part of evaluation and work up of patients with abnormal nipple discharge.

Ultrasound guided biopsy techniques :

Ultrasound guided needle biopsy.

Ultrasound guided cyst aspiration- if contents are clear no need for Cytological examination.

Ultrasound guided FNAC and Core biopsy

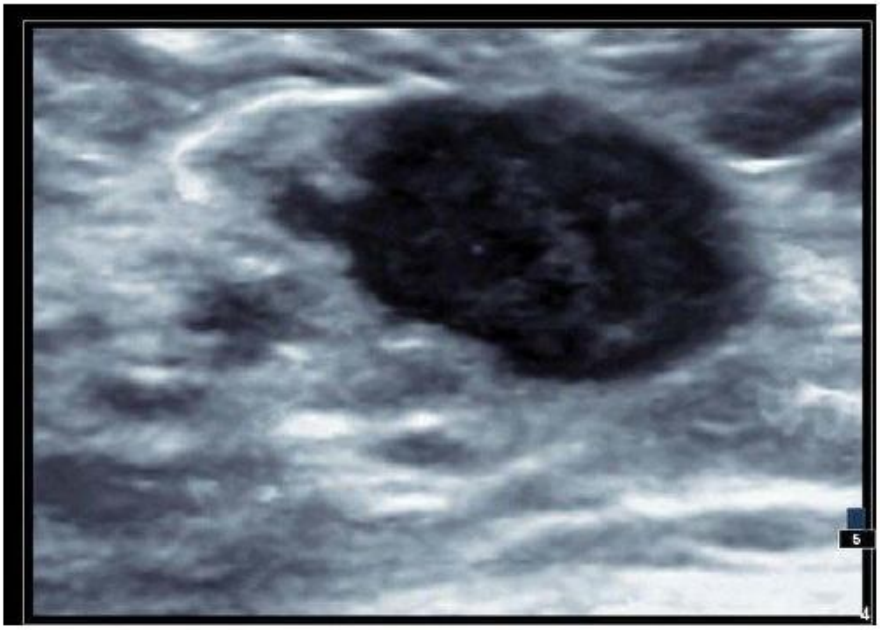
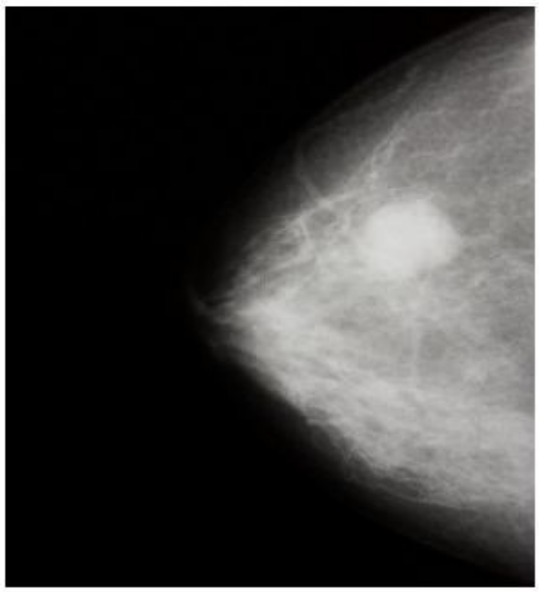


Fig 19 : Ultrasound of the breast for a case of carcinoma breast showing the lesion in the centre

MAMMOGRAPHY

0.1 cGY dose of radiation is delivered in conventinal mammography. At this radiation There is no risk for development of carcinoma breast. .Two views used are mediolateral and craniocaudal view. Used mainly in elder womens who having loose breast tissue compared to younger womens having dense breast tissue.



Screening Mammography:

At present screening mammography should be offered:

1. Annually to women aged 50 and older.

2. At least biennially in women aged 40 to 49.

3. Annually in younger women with significant family history, histological risk or a history of prior breast cancer.

Diagnostic mammography may be offered to:

1. Evaluate opposite breast.

2. To evaluate questionable or ill defined mass or other suspicious changes in breast

3. To search for occult cancer in patients with positive nodal status

4. When women is undergoing conservative breast surgery to detect concomitant lesion in the same breast.

Mammographic abnormalities suggestive of malignancy can be divided into:

• Density abnormalities-masses, architectural distortion and asymmetries.

• Micro calcifications-

.

Ductography:It uses a small scope to visualize individual duct. indicted in ductectesia, bloody Nipple discharge and individual duct pathology

Thermography: Malignant lesions are hotter than normal and benign lesions due to increased vascularity and increased metabolism. It has 85% diagnostic accuracy.

Magnetic Resonance Imaging:

1. recurrence and scar tissue can be easily identify

2. breast implants

3.to evaluate axillary nodes and recurrence diseases.

4.obese patients

5.un cooperative patients

Investigations to assess the metastases

Liver function tests: Enzyme levels may be elevated in hepatic metastases.

Serum calcium: elevated in patients with bony metastases.

Chest X-ray: Features suggestive of secondaries include coin lesions, interstitial infiltration, mediastinal widening, pleural effusion and rib secondaries.

Bone X-rays: Usually present with osteolytic lesions while some lesions are rarely osteogenic.

Bone Scan: Technetium Tc99 labeled bone scans are more sensitive than X-rays.

They are most helpful when strong suspicion of skeletal metastases is present.

Ultrasound scan of abdomen is used to asses liver metastases, lymph nodes, free

Indications for whole body scan

- T3, T4 advanced disease
- Advanced nodal disease
- Bone pain, bone swelling, pathological fracture
- Chest/liver secondaries

HORMONE RECEPTORS

The laboratory discovery and subsequent measurement of estrogen receptors (ERs) and progestin receptors (PRs) in breast tumors have given the physician useful tools to aid in the treatment of women with breast cancer. The ER and PR belong to a large class of nuclear receptor proteins, are present in normal breast, and other tissues and are expressed in up to 60% to 70% of breast cancers. In both normal and tumor cells, estrogen binds to the ER, which is a large protein molecule located in the cytoplasmic and nuclear fractions of the cell. The receptor hormone complex results in gene activation and transcription of mRNA and cell proliferation.
The blockade of estrogen inhibits protein translocation, cell proliferation, and leads to initiation of cell death. One method of

reducing estrogen levels is with direct blockade of ER with drugs like tamoxifen. Synthesis of progestin receptors is a product of estrogen action on cells, it is an estrogen dependent process. Hormone receptors can be routinely identified by a variety of immunohistochemical staining of the breast tissue. Specimen may be obtained by core cut needle biopsy, open biopsy or postoperative specimen of breast tissue.

Hormonal therapy should be recommended to patients whose Breast cancer contains ER or PR, regardless of age, menopausal status or involvement axillary nodes. Benefit of hormonal therapy in receptor negative tumors is very less.

ER	PR	Response Rate
+	+	78%
+	–	34%
–	+	45%
–	–	10%

MANAGEMENT OF BREAST CANCER

Management by multimodal approach

Surgery

chemotheraphy

Radiotheraphy

Hormonal theraphy

surgical procedures

1. Excisional biopsy with wire localisation: it includes complete removal of a Lesion in the breast with surrounding normal tissue as margin. Circum-areolar incisions give excellent scars. In breast peripheries incisions parallel to Langer's lines give good results. After excision, specimen is sent to histo-pathological examination after tagging it with sutures or clips. Preoperative mammography and wire localization is essential

2. Sentinel Lymph Node Biopsy: The concept of sentinel lymph node (SLN) Biopsy is based on hypothesis that lymph flow is orderly and predictable and the sentinel node is the first node encountered by tumor cells and its histological status predicts distant lymph basin status. In 1977, Cabanas was

the first person to introduce the SLN biopsy as staging procedure for penile carcinoma later it was applied by Morton and co-workers to melanoma in 1992

- Inclusion criteria

Early breast cancers (T1 and T2, N0).

T3N0 cancers.

In women undergoing neoadjuvant chemotherapy for breast conservation and

clinically uninvolved axilla.

- Exclusion criteria

Patients with clinically involved axilla.

Pregnant and lactating women

Multifocal/multicentric carcinomas of the breast.

History of previous breast surgery on same side.

Prior chemotherapy or radiotherapy.

Technetium 99m labelled colloid particles are used and hand held gamma probes are used to detect them intraoperatively. Isosulfan blue dye injection is also used, which permits direct visualization of stained nodes intraoperatively Injection techniques: Subdermal injection on the day preceding operation using a 25

gauge needle. Based on fact that breast is developmentally derived from ectoderm and breast lymphatics meet at sub areolar plexus.

Not used for Isosulfan injection Peritumor injection: The radiocolloid and Isosulfan is injected around tumor into the breast parenchyma. Imaging is done 1-2hr after the injection.

On the day prior to surgery

subdermal radiocolloid is injected subdermally and in the operating room isofulfan blue is injected.

By gamma probe localization a skin incision is made over axilla and aided by direct

Isosulfan blue visualization the involved node is excised, and sent to HPE.

Advantages:

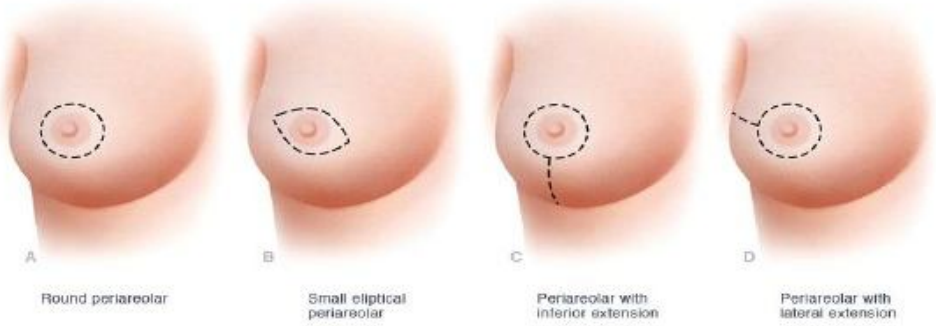
Minimally invasive; reduces morbidity and cost; provides detailed histological analysis; nodal metastases outside axilla can be detected and finally it obviates the need for routine ALND in all breast cancer patients without compromising staging information, local control or long term survival.

MASTECTOMY:

Implies to surgical removal of entire breast parenchyma.

Skin sparing mastectomy (SSM):

Includes the resection of nipple/areola complex, any existing biopsy scar, and removal of entire breast parenchyma. If indicated a sentinel lymph node biopsy or axillary can also be performed. The types of incisions can be used are periareolar, tennis racquet, reduction mammoplasty and modified elliptical.



Advantages: Minimal skin is harvested, thus generous skin envelope remains after mastectomy, thus cosmetic results are excellent. It affords improved symmetry with the contralateral breast when compared with traditional non-skin sparing mastectomy Can be done in early breast cancers but contraindicated in inflammatory carcinoma, locally advanced cancers and multifocal disease. Recrrance rate < 2%

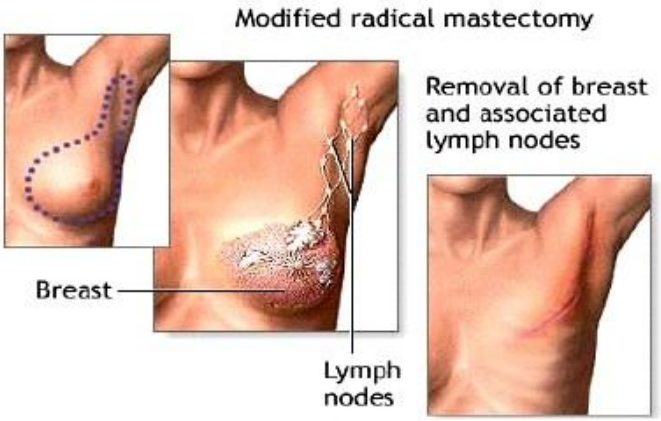
Simple mastectomy: In simple mastectomy skin , all breast tissue and nipple areolar Complex are to be removed

Extended simple mastectomy - Removal of all breast tissue + skin+ NAC+ Level 1 and 2 axillary lymph nodes

Radical Mastectomy:, removal of all breast tissue + skin+NAC+ pectoralis Major muscle+ pectoralis minor+level 1,2,3 nodes.axillary vein, cephalic vein and long thoracic nerve of Bell are preserved. Although good loco regional control is obtained this procedure is no longer indicated as
it causes excessive morbidity with no survival benefit.

Modified Radical Mastectomy: In modified radical mastectomy (MRM)
both the pectoralis major and pectoralis minor muscles are preserved, with removal with removal of level 1 & 2 nodes. Patey's

MRM removes the pectoralis minor muscle. Scanlon modified Patey's procedure by dividing but not removing pectoralis minor. Madden and Auchincloss advocated preservation of both pectorals, Axillary approach was obtained by retraction of pectoralis minor. This procedure is widely practiced now.



Operative Procedure

Anesthesia: This procedure is performed under general anesthesia.

Access:

Place the patient in supine position, with arm on operating side extended on anarm board.

Prepare the skin and place towels to allow access to breast and axilla. With skin marking pen draw a transverse elliptical incision (Stewart's)

and encompass approximately 5cm of skin around the lesion and also the nipple.

Ensure that you will be able to approximate the wound edges after surgery.

Action

Elevate the skin flaps in the subcutaneous plane

Ensure the flaps are not too thin, no breast tissue is left behind.

Raise the upper flap to the upper limit of breast that is 2-3 cm below clavicle. Raise the lower flap to the lower limit of breast, upto infra-mammary fold. Dissect down until pectoralis fascia is reached, introduce a finger covered by a swab and find a submammary plane between the fascia and the breast.

Flap to be raised

Laterally- anterior margin of latismus dorsi

Medially- mid sternum

Superiorly- subclavius muscle

Inferiorly- 2- 3 cm below submammary fold

Preservation of the medial pectoral nerve is made in this procedure.

Axillary dissection: The axillary lymph nodes are removed as a part of modified radical mastectomy.

The axilla is opened by an incision in axillary fascia, The cephalic Vein should be preserved as it is an important collateral if main axillary vein is injured.

Using combination of sharp and blunt dissection lateral border of pectoralis major and anterior border of latissimus dorsi are identified; these landmarks form limits of axillary dissection.

For level II nodes pectoralis minor beneath pectoralis major is pulled out and retracted forwards and medially.

If level III clearance is desired, both borders of pectoralis minor should be defined and divided at its insertion to coracoid process.

The thoracodorsal bundle, the long thoracic nerve is preserved; the intercostobrachial nerve may be sacrificed.

Then the wound is closed in two layers with a closed system suction drainage.

4. BREAST CONSERVATION SURGERY (BCS):

Removal of tumor with 3 dimensional clearance followed by adjuvant radiation therapy, and assessment of axillary lymph node status

Indications: stage I or II diseases

Contraindications: Multicentric disease; diffuse malignant appearing calcifications on mammogram; prior therapeutic chest irradiation; positive margins on lumpectomy;history of collagen vascular disease and size of tumor greater than 5 cm

Non-surgical breast cancer therapies

RADIATION THERAPY :

Radiotherapy as primary treatment is used in tumor of less than 5 cm where a conservative surgery is done and in case of locally advanced carcinoma, which are not amenable to surgery.

The breast and regional lymph node are is given 50 Gray over 6 weeks with an additional 15 Gray to the lumpectomy site and 10 Gray to the lower axilla in the same overall time.

In locally advanced tumor where surgery is not done the tumor mass is given a total of 75 Gray at 10 Gray per week. If there are palpable nodes in the axilla they too are given an additional dose of

70 Gray over 7 weeks. It is claimed that this treatment gives good tumor control and cosmetic effect.

1. Adjuvant radiotherapy:

In order to reduce the morbidity associated with radical mastectomy, McWhirter introduced the combination technique of simple mastectomy and radiotherapy. The objective was to irradiate the involved breast and chest wall together with axillary, supraclavicular and ipsilateral internal mammary lymph nodes.

2. Palliative Radiotherapy:

Palliative radiotherapy is used in disseminated breast cancer because focal areas of metastatic disease are effectively managed by radiotherapy. Bone metastasis 30 Gray in 10 fractions, given in 2 weeks will give good palliation from pain. Brain metastasis 40 to 50 Gray in 15 fractions under cover of anti edema measures.

Adjuvant Chemotherapy:

Adjuvant chemotherapy demonstrated reductions in the odds of recurrence and death in women age 70 years or less with stage I, IIa, IIb

cancer. Adjuvant chemotherapy is of minimal benefit to node negative women with cancers 0.5 cm or less and is not recommended. Node negative women with cancer
0.6 to 1.0 cm are divided into those with low risk of recurrence and those with unfavorable prognostic features. Adjuvant chemotherapy is recommended in women with unfavorable prognostic features. For women with hormone receptor negative cancers larger than 1cm adjuvant chemotherapy is recommended. Current treatment of IIIa cancers is modified radical mastectomy followed by adjuvant chemotherapy with a doxorubicin-containing regimen.

4 . Neoadjuvant Chemotherapy:

Involves a course of preoperative chemotherapy for locally advanced cancers considered operable. the chemotherapy cycles are given before the surgical procedure to downstage the disease while the other half is given after the procedure. For inoperable cases neoadjuvant chemotherapy is adviced to decrease the tumor burden. After neoadjuvant chemotherapy, MRM can be done followed adjuvant chemotheray

Chemotherapy for Distant Metastases:

For receptor positive stage IV diseases, an anti-estrogen therapy can be preferable. for receptor negative cancers + symptomatic metastases systemic chemotherapy is adviced

Hormonal Therapy: Hormonal therapy can be used as an adjuvant to surgery in the early breast cancer or for palliative treatment of advanced breast cancer.

Modalities o f hormone manipulation in breast cancer are:

1. Ovarian, ablation-surgical, radiation medical
2. Anti-oestrogens
3. Progestins
4. Aromatase inhibitors
5. Others

Ovarian ablation: Useful in pre-menopausal women who are ER+ as a first line endocrine manipulation Surgical ablation involves removal of both ovaries by simple procedure. The clinical benefits are seen almost immediately. There is no risk of symptom flare-up But it induces artificial menopause and its attendant problems.

Radiation castration involves radiating the pelvis to 2000 cgy in 4-5 fractions The benefits of treatment are seen only after 2-3 weeks and it may not be complete. Risk of flare reaction is present.

Medical oophorectomy is done by using LHRH analogs like Goserelin or Leuprolide. There is an initial upsurge of LH and oestrogen leading to an initial flare of symptoms. But continued exposure leads to down regulation of LH receptors in the pituitary with inhibition of LH and decrease of oestrogen to castrate levels. The main advantage is that the above process is reversible once the treatment is stopped. Recommended dose is Goserelin 3.6 milligrams injected subcutaneously, once a month.

Anti-oestrogens : These drugs compete with oestrogens for binding to the receptors.

The receptor complex inhibit the gene transcription of stimulatory growth factors and enhances that of inhibitory growth factors and thus produces its anti-proliferative effects. They block the cells in G1 phase and are at best cytostatic.

Tamoxifen, a non-steroidal anti-oestrogen, with partial agonist activity. It has been studied extensively and is widely used, both in pre and postmenopausal women in a dose of 20 milligrams per day. Adjuvant tamoxifen should be given for atleast 2 years and 5 years use is superior to 2 years use. It is most active when the amount of oestrogen with which it has to compete with is less. When used in pre-menopausal women, barrier contraception should be advised. This is because tamoxifen does not suppress ovarian function completely and hence ovulation continues to occur in these women. It is well tolerated, relatively inexpensive and with minimal side effects.

Nausea, vomiting, spotting, skin rash, oedema, abnormal LFT are seen in about 3%, ocular disturbances, tumor flare,hot flashes, thrmoboembolic,endometrial cancer. menopausal women, it produces beneficial effect on osteoporosis and coronary artery disease due to its partial agonist activity.

Progestins: The drugs mainly used are medroxy progesterone and

megastrolacetate. The latter has been widely used evaluated in both pre and post- menopausal women in a dose of 160 mg/day. The exact mechanism of action is not known. It may have a direct cytotoxic effect mediated through hormone receptors as well as inhibition of hypothalamus- pituitary-adrenal axis. It is associated with many disturbing side effects like sweating, leg cramps, fine tremors, fluid retention, hypertension, weight gain, hypertrichosis, spotting, cushinoid appearance, worsening of diabetes etc. It is generally used as a second line therapy after ovarian ablation/tamoxifen but is losing popularity due to availability of newer and better drugs.

Aromatase inhibitors:

Aminogluthemide was the first drug in this class. It causes "medical adrenalectomy" by blocking several enzymes in the pathway of steroid synthesis including aromatase, which converts androstenedione to oestrogen. Because of its non- selective action, patients need replacement doses of corticosteroids. It was used in post- menopausal women in a dose of 500 mg/day along with 40 mg/day of hydrocortisone. Patients with bone metastases show better response to this drug when compared with tamoxifen. Side effects include lethargy, skin rash, pruritus, orthostatic hypotension,

ataxia, mild hypertension etc.

Several newer aromatase inhibitors are available today which are More specific in inhibiting only the aromatase enzyme and not the other enzymes involved in steroidogenesis. The drugs available in India include Letrazole 2.5 mg tab, once daily and Lentaron 250 mg IM injection once in 2 weeks. The toxicity profile is much safer, there is no need for steroid supplementation and response rates are better. They are fast becoming the choice for second line of therapy in post-menopausal women after ovarian ablation/tamoxifen. Trials are underway in comparison with tamoxifen as first line of therapy post-menopausal women. Others like adrenalectomy, hypophysecotomy, androgens, oestrogens etc.,are considered obsolete and no longer recommended as part of treatment of breast cancer

Guidelines for endocrine therapy in breast cancer:

The key for successful endocrine therapy in a patient is the hormone receptor status of the tumour. The levels of oestrogen receptor (ER) is most important. Patients with ER values > 30

fmol/mg have response rates of 75% compared to 20% for those with ER values of 3-10 fmol/mg. There is no definite cutoff point to label as ER + ER-. For practical purposes all these tumours with ER protein level of > 10 fmol/mg are considered ER+ and others as ER-. About 2/3rd of post-menopausal women are ER+

The response rates to endocrine therapy based on ER status is as given below:

Receptor status unknown: RR 30%

ER and PR positive: RR 70%

ER and PR negative: 5-10%

Response rates to hormonal therapy are highest in women with soft tissue disease, intermediate in those with bone metastasis least in those with visceral disease.

Recommended sequence of HT: Pre-menopausal women

First line therapy: Ovarian ablation / tamoxifen

Second line of therapy: Aromatase inhibitors like Letrazole or Megastrol acetate

Post-menopausal women: No role for ovarian ablation. Tamoxifen is choice of first line of therapy, second line therapy- Newer aromatase inhibitors or megastrol acetate

TREATMENT OF BREAST CANCER

Once diagnosed of breast cancer, treatment option determined by the clinical stage of the disease. But before any therapy is started, themdoctor must discuss the plan of treatment and all the complications with the patient and the attenders.

In Situ Breast Cancer (Stage 0)

Lobular carcinoma in situ (LCIS): follow up of the patient, if needed tamoxifen can be added. Regular follow up is needed to monitor the progression of lesion to invasive cancer

Ductal carcinoma in situ (DCIS): Total Mastectomy is done for women with DCIS and evidence of extensive disease while Lumpectomy and radiation therapy is done
for women with limited disease. Lumpectomy alone is enough for women with lesion less than 0.5 cm.

Early Invasive Breast Cancer (Stage I, IIa, or IIb):

a. Mastectomy with axillary lymph node dissection and

b. Breast conservation surgery for stage 1 & 2

Indications of Total Mastectomy in early Breast Cancer :

- When Tumour is more than 4 cms
- Multicentric tumour
- Poorly differentiated tumour

Traditionally axillary clearance is done upto level II in early stage

breast cancer Systemic therapy for early stage breast cancer

Adjuvant chemotherapy:

- all node positive cancers.
- Tumor > 1cm in size.
- Lympho vascular invasion, high grade tumors ER, PR negative and HER2/neu over expression

Tamoxifen therapy; hormone receptor positive women with tumor size > 1 cm

Radiation therapy: All conservative breast surgeries need radiation

to chest wall. If lymph node status is N0 then no radiation to axilla

is needed. If N1 and less than 3 nodes are positive, no radiation to

axilla is given (plus axillary dissection). If N1 and more than 3

nodes radiation is mandatory to axilla (plus axillary dissection).

Locally advanced breast cancer (Stage IIIa or IIIb):

Stage IIIa with operable disease:

Modified radical mastectomy with adjuvant chemotherapy + radiation

therapy. Chemotherapy is used to maximize distant

disease free survival while radiation therapy is used to maximize

locoregional disease free survival. Neoadjuvant chemotherapy can

be done in selected cases of IIIa cancers.

Stage IIIa (inoperable) and IIIb: Neoadjuvant chemotherapy +

Modified radical mastectomy + adjuvant chemotherapy + adjuvant

radiation therapy

Distant metastases (Stage IV):

Hematogenous spread to lung/ liver/bone/brain/adrenals can occur.

Metastatic lesion Is evaluated by CECT / Bone scan/ image guided

FNAC

Treatment options :

- To improve quality of life
- To relieve pain of secondaries like bone, lungs
- To relieve neurological problems like convulsions, space occupying cranial problems

Other symptomatic relief

Treatment strategies in metastatic carcinoma of the breast includes :
1. Chemotherapy : CMF, CAF, Taxanes in combination.

2. High dose of chemotherapy using cyclophosphamide, cisplatin, carmustine, melphalan.

3. Haemopoetic growth factor – enhance cell kill with less bone marrow

4. Radiotherapy – used in bone metastasis, brain secondaries

BREAST CANCER PROGNOSIS – 5 yr survival rate

Stage I – 94%

Stage IIa – 85%

Stage IIb – 70%

Stage IIIa- 52%

Stage IIIb – 48%

Stage IV – 18%

PREVENTION OF BREAST CANCER

Prevention is always better than cure. Hence based on the concept that detecting and treating small cancers and precancerous lesions could save lives, breast screening and more recently chemoprevention of breast cancer in high-risk groups have been started to reduce the mortality associated with the disease.

The three commonly used screening methods are:

1. Breast self examination: Women are educated to examine their own breasts, look for any change in contour, size, shape or any lumps inside. The ideal time is to examine the breast is just after menstruation. Women are told to examine the breasts in lying down position.

2. Clinical breast examination: Breast examination that is done by a doctor or any medical personnel is described here. It is used as a follow-up protocol with uneducated or uncompliant patients or patients who present with any breast related symptoms.

3. Screening Mammography: Breast screening in UK aims to reach 70% of target.Two view MLO and CC, with double reading of films every 2-3 years aim to detect small cancers

Women at increased risk of breast cancer :

genes predisposing to breast cancer have been identified including BRCA-1;BRCA-2 and p53. Detailed genetic assessment and follow up is essential in women of families

with either breast or ovarian cancers in 3 generations or a living individual in the family

Thus, women with high risk are usually given three options:

1.increased frequency f screenind; regular and mammographic examination for younger womens at high risk of developing breast cancer. Mammography should be started at 35 years or 5 years younger than the youngest affected family member.

2. Prophylactic surgery: women with very high risk (>35%) of Breast Cancer may consider for prophylactic surgery with breast reconstruction. The reduction of incidence of breast cancer by wordwide

3. Chemoprevention: Tamoxifen and Raloxifene are the two drugs presently 3. Chemoprevention: Tamoxifen and Raloxifene are the two drugs presently prescribed for cancer

In the late 20th century, the aim of imaging was anatomic delineation of the breast, while recently the major focus has been shifted toward physiologic and molecular tumor detection.

The goals of imaging are :

1) the earliest possible detection of the tumor

2) correlation of imaging results with other clinical parameters to assess disease

3) accurate staging and follow up after treatment

Newer imaging modalities used nowadays are :

1. Digital Mammography:

It is a type of mammography that records the radiographic images electronically in a digital format and is stored in computer. These can be displayed on a fluorescent monitor or transferred to hard copy. X rays passing through the breast are converted in to an electric signal that can then be processed by a computer. These mammography systems count the numbers of X ray photons passing through the breast at every point and provide a number (digit) for each point that indicate the count

Basic difference between conventional and digital mammography is

that in conventional mammography the film acts both as detector (that acquires the image) and as display media. While in digital mammography, image acquisition occurs in three steps:

1) detection of photons

2) computer display of image

3) storage of image.

In digital mammography, an image can be optimized and adjusted to allow visualization of subtle details. Digital mammography will solve many of the problems inherent to film mammography, such as limited contrast, lost films, limited film storage.

2. Digital Subtraction Mammography:

It is done using intravenous contrast. Precontrast images are subtracted from post contrast images electronically. It is believed that this may be of value in visualizing the breast cancer better; particularly gauging extent of disease in patient with high risk for multicentricity. This may be especially useful in women with dense breast, and those with invasive lobular carcinoma, as this lesion is especially difficult to fully characterize using traditional technology

3. Computer Aided Detection And Diagnosis (CADD):

Detection algorithms for specific mammographic features associated with malignancy are used. CADD uses software to assist radiologists in interpreting mammograms. Large numbers of normal and abnormal digital mammograms are needed to train the computer in how to distinguish abnormal areas. CADD enhances the mammographer's ability to detect breast cancer.

4. Power Doppler Ultrasound:

Doppler technologies have been now used to differentiate benign From malignant lesions. The fact of angiogenesis occurring in malignant lesion has been used. Doppler ultrasound has the capability not only to document the presence of this microvascularity, but also to characterize vessels further in terms of benign and malignant characteristics. Raza and Baum56 correlated patterns of vascular distribution and morphology of blood vessels with histology. They found that using the presence of penetrating vessels, sensitivity of Doppler was 68% and specificity was 95 %. Additional role of Doppler ultrasound requires further studies.

5. 3D Ultrasound

Displaying vascularity in three dimensions is relatively simple, since the image segmentation is performed by the color Doppler flow imaging system, and sparse vascular patterns are easily appreciated in three dimensions. Doppler flow imaging to B-mode imaging improved the diagnostic accuracy by an amount approximately equal to the benefit of adding USG to mammography. They state that the chance of malignancy after workup must be less than 2% to consistently avoid biopsy.
The amount of blood flowing as indicated by power-mode color Doppler imaging (p-CDI)4 and the velocity indicated by mean-frequency color Doppler imaging (f-CDI) both lend themselves to quantitative measurement.

6. Magnetic Resonance Imaging:

New protocols, image interpretation criteria and terminology have Been standardized. In MR imaging of breast, Gadolinium chelate is given as a rapid intravenous bolus injection. During the first pass phase of the contrast, the difference between intravenous and extra venous compartment is maximum, and in this phase, transportation of contrast from vessel into the tissue occur rapidly. Contrast medium

present in capillaries and extra vascular extra cellular compartment provide enhancement. Regions of hypervacularity, increased capillary permeability, and increased interstitial space develop predominantly at the margins of tumor because of angiogenesis. This creates beds of pooling of contrast.

MR RODEO: Rotating Delivery of Excitation off resonance sequence is a specialized high resolution fat suppressed technique first described by Harms et al It has a sensitivity of 95% in the diagnosis of breast cancer. Most important role of MR imaging is in identification of tumors not detected with conventional imaging methods. The sensitivity of MR imaging in the diagnosis of breast cancer is 80%-100%12 and specificity exceeds 80%.60 MR imaging is especially useful in dense breast that significantly impair mammography. While mammography and ultrasonography depend on architectural distortion to detect tumors, MRI uses morphological and physiological properties, allowing it to assess

tumors that cause no architectural distortion. In addition MRI depicts soft tissue with more gradations of contrast than mammography and ultrasound, and provide thin-section and multi-planar imaging, thus allowing better characterization of lesion.

Recommended indications of MRI of breast

1. Investigation of the source of axillary adenopathy when mammography and ultrasound are unhelpful.
2. Follow up for recurrence of the breast cancer after surgery or radiotherapy.
3. Evaluation of augmented breast.
4. Staging of DCIS, lobular carcinoma, and suspected multifocal breast cancer
5. Assessment of high risk patient who carry the BRCA gene and have dense breast

To summarize, MRI of the breast is more accurate than mammography and ultrasonography in the local staging of the primary breast cancer, diagnosis of local recurrence, assessment of response to neoadjuvant chemotherapy and evaluation of silicon implant.

7. Scintimammography :

Nuclear medicine breast imaging provides functional or metabolic Information of breast tumors as these techniques are based on physiologic and biochemical characteristics of tumor. 99mTechnetium sestamibi and 99m Tc-tetrafosmin are most commonly used radiotracers in scintimammography. As it is avidly taken by the tumor cells, its role in cancer imaging has been studied. Mammoscintigraphy has excellent sensitivity to find tumor size > 1cm sensitivity is poor for smaller, nonpalpable or medially located tumors. Overall sensitivity for palpable lesion is upto 100%, while for nonpalpable lesions, as low as 25%. Specificity ranges from 74% to 90% .

8. Positron Emission Tomography Scan (PET scan)

It is a functional imaging technique. It can be used to measure Tumor metabolism, assess blood flow, and quantitate estrogen and progesterone density cancer cells have altered glucose metabolism and hence increased glucose uptake by cancer cells Compounds labeled with positron emitting radionuclide without losing their chemical properties are injected intravenously. After reaching in to the tissue, these compounds emit positron (positively charged electrons). These positrons travel only

short distance (0.2-2.5 mm) within surrounding tissue before they collide with a local electron. This collision produces two gamma rays at 1800 to each other. The patient is placed in the center of a ring of gamma ray detector and simultaneous emission of these gamma rays is detected. Tomographic images are produced with the help of computer. The most commonly used positron emitting tracer is the glucose analogue 2-(18F)-fluoro-2-deoxy-D-glucose (FDG). This compound is thought to accumulate in malignant cells because 1) malignant cells have high level of hexokinase. This enzyme catalyze rate limiting step in glycolysis i.e. conversion of glucose to glucose-6- phosphate. If the positron emitting substance is provided for substrate for the hexokinase catalyzed reaction, 2-(18F)-fluoro-2-deoxy-D-glucose -6- phosphate is produced. This compound can not be metabolized further. Therefore the rate limiting hexokinase catalyzed reaction has effectively been isolated from main glycolytic pathway and thus the rate at which FDG accumulate in the cells is proportional to the rate of cellular glycolysis. 2) Malignant cells have increased membrane Glut-1 and

Glut-3 transport proteins which allow malignant cells to accumulate glucose at higher concentration. PET scan is 80-100% sensitive and up to 100% specific As lesions smaller than 1 cm may be missed, PET will not be able to replace conventional imaging in the diagnosis of breast cancer. PET has also been used to monitor response to neoadjuvant chemotherapy. PET is able to show any change in metabolism before any morphological change Digital Absorption Ratio (DAR) using PET scan may be useful prognostic indicator for patients with breast cancer. In one study63, DAR was found to be one of the most important factors predicting relapse free survival. FDG scan has also been evaluated for its ability to diagnose Axillary lymphadenopathy. In his study, Adler et al64 found that it had a sensitivity of 95%. They concluded that patients with negative scan in the axilla did not require Axillary dissecton. bone metastases from breast cancer65. It is also superior to other modalities in the detection of soft tissue metastases.

To summarize, PET scan may not be superior to conventional Imaging methods of mammography, sonography and MRI. But it has a high sensitivity and is unlikely to replace conventional imaging.

Minimally invasive techniques for breast cancer treatment are :

1. Stereotactic excision

a. Advanced breast biopsy instrumentation

b.Vacuum assisted core biopsy instruments: Mammotome, Minimally Invasive Breast Biopsy(MIBB)

2. Cryosurgery

3. Laser interstitial therapy

4. Radiofrequency ablation

5. Radio-guided localization of nonpalpable tumors

Newer Prognostic Markers in Breast Cancer

It is well known that there is no increased risk of malignancy, in case of histology of benign breast disease (BBD) being adenosis, apocrine change, duct ectasia or mild epithelial hyperplasia. There is slight increased risk (1.5 to 2 times) if histology of BBD is sclerosing adenosis, papilloma or moderate / florid hyperplasia There is moderate increased risk (4.5 to 5 times) when the histology of BBD is a typical hyperplasia ductal or lobular. A very high risk of developing cancer (8-10 times) is expected if histo-pathology is lobular carcinoma in situ or ductal carcinoma in situ Some of the currently well known prognostic factors for breast cancer are host factors like age, menopausal status, inflammatory response and adjacent in-situ disease with tumor factors like size, vascular invasion, nodal involvement, hormonal status, DNA-content, ploidy and S-phase. Out of above, nodal involvement is most

Level I inferio-lateral to Pectoralis minor (proximal), Level-II behind Pectoralis minor (middle), Level-III medial to Pectoralis minor distal). Involvement of upper nodes denotes a worse prognosis than involvement of proximal level lymph nodes. However, prognosis is related more directly to the total

number of nodes involved, than to the level of involvement. The post surgical treatment pathologic classification is a better guide than the clinical TNM

Classification.

However, it is of interest to know the markers that can predict the future of node negative disease, chemotherapy resistance and resistance to hormone therapy in ER(+) PR(+) case

4 prognostic factors namely Genetic factors, Adhesion, Invasion And Proliferation are important in breast cancer.

1. The genetic factors of importance are lack of tumor suppressor oncogene like P53 and ras-gene, or increased level of tumor promoter oncogenes like C-myc, nm 23 m

RNA at g, HSP, Rb (retinoblastoma gene). BRCA 1 and BRCA 2 are important in familial cancers

2. Adhesion is predicted by neo-angiogenesis and micro-vessel count, thus inviting role of agents like protamine and fumagillin, which inhibit neo-angiogenesis.

3. The third quality of invasion can be predicted by Cathepsin D, Integrin, Laminin receptor, Matrix metalloproteases and enzyme collagenase Type IV (MMPz). They also indicate high probability of loco-regional recurrence. Invasion can also be

predicted by markers such as Plasminogen Activator like

Urokinase Plasminogen Activator (UPA), Laminin Receptor and Integrin. Cathepsin-D denotes 7 times more chances of recurrence in node negative patient.

4. Proliferation can be predicted by either growth factors like neu (or erbb-2), EGF Receptor (ERBB-1), Insulin growth factor-1, Transforming Growth factor (TGF), Fibroblast Growth Factor (bFGF), Platelet Growth Factor (PDGF), Proliferating Cell Nuclear Antigen (PCNA), Agnors, P 120 and PS2.

The high level of erbb2 denotes 5 times more mortality in the Node Negative patient. And in good nuclear grade, high level of erbb2 denotes relapse 3 times more and death 9 times more often frequently as compared to low level of erbb2 in the same set of patients.PS2 is better than ER or PR in predicting response of hormone therapy and can tell which ER(+) PR(+) will not respond to hormone therapy and which ER-ve will respond. High level of EGFR denotes resistance to Tamoxifen. The high level of HSP27 denotes strong possibility of resistance to Adriamycin and Toremifene can overcome the resistance. High level of erbb2 denotes strong possibility of resistance to CMF.One can predict prognosis in node negative breast cancer. The useful prognostic factors are HSP - 27, C-myc, nm23, P-53, PS-2, Angiogenesis,

Micro- vessel Count, Integrin, UPA, PAI (Plasminogen Activator Inhibitor), Cathepsin-D EGFR, erbb2/neu, Agnors, S-phase fraction and familial syndromesHowever, out of above markers, ER, PR, PS2, P53, Cathepsin D, and neu ,erbb2) are easily available in India.

Reconstruction of breast

A woman can be a devastated emotionally after losing a breast as it Is frequently perceived as loss of her femininity. Reconstruction of a breast following mastectomy is hence, one of the most rewarding surgical procedures today. Recent advances in the surgical techniques and the advent of new devices have made it possible to reconstruct a breast that can simulate a natural breast in both its form and appearance. Thus there is an ever increasing demand for breast reconstruction following mastectomies nowadays Although it has been well established that breast reconstruction has no adverse impact on the course of the disease, it does not interfere with postoperative adjuvant radiotherapy or chemotherapy, it is not that widely used. The concern that

reconstruction might prevent or obscure early detection of a local recurrence is no longer valid because of the recent advances in modern diagnostic imaging techniques. the current era, there is hardly any contraindication to either immediate or delayed breast reconstruction following mastectomy.

TIMING OF RECONSTRUCTION

The breast reconstruction process may begin at the time of mastectomy immediate) or weeks to years afterwards (delayed-usually 3 – 9 months after surgery] Immediate reconstruction means that the procedure begins at the time of the mastectomy. It is performed with the procedure but can be associated with a few post op wound complications and prolonged stay in the hospital. process is already underway when the patient wakes up from the mastectomy, and Two potential advantages of immediate reconstruction are that reconstruction there may be a cost savings in combining the mastectomy procedure with the first stage of the reconstruction

An advantage to delayed reconstruction is that the patient can delay their reconstruction decision and surgery until other treatments, such as radiation therapy and chemotherapy, are completed. Delayed reconstruction may be advisable if the surgeon anticipates healing problems with mastectomy, or if the patient just needs more time to consider the reconstructive options. It allows for post op radiation without prosthesis exposure and avoids fibrosis and fat necrosis where TRAM flap is used

Factors deciding reconstruction :

Amount of Skin retained

Stage of carcinoma

Earlier Radiotherapy

Type of flap used

Surgical options: Reconstructive options can be divided into two main types:

1. Autogenous tissue: Abdominal based flaps (TRAM, Single pedicle, Double pedicle, Free flap), upper abdominal horizontal flap and tubed abdominal flap.

Latissimus dorsi flap, Gluteal flap, Rubens flap (Soft tissue pad overlying the iliac crest based on deep circumflex iliac vessels),

Lateral thigh flap and thoracoepigastric flap are some examples.

2. Alloplastic materials: Silicone gel implant, Silicone implant with saline fill smooth wall, textured wall, round shaped, anatomic shaped), Expandible saline prosthesis are used. Implants are kept in submuscular plane if muscle is not removed during surgery. If the muscle is removed as in radical mastectomy, subcutaneous implants are placed.

Nipple is created using :

Local Breast Flaps 3 months after breast reconstruction.

Nipple sharing from contralateral nipple using composite graft.

Skate flap : Local Flap with de-epithelialised donor site around the periphery over which a full thickness graft is applied.

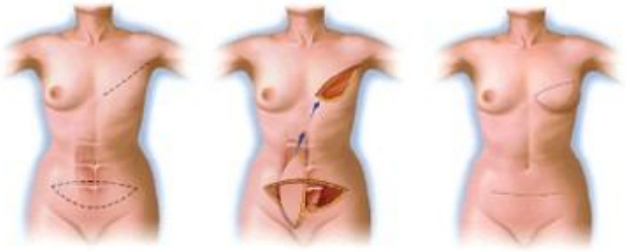
Nipple prosthesis can be fitted. Areola Pigmentation is created by (done 3 weeks after nipple creation) :

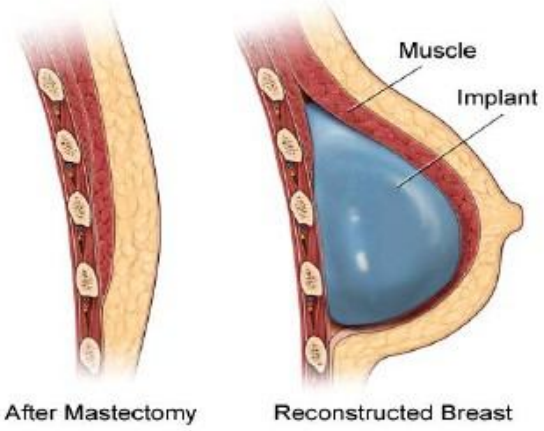
Full thickness skin graft from non hairy skin lateral to labia majora as the pigmentation of this graft matches that of the areola.

From contralateral areola if reduction mammoplasty is done on that side.

Tattooing : Colour tends to fade away with time and may require revision.

Split skin grafting from retroauricular area or from thigh.





PROSTATE SPECIFIC ANTIGEN

PSA is a 33 kDa glycoprotein with serine protease activity. The production of PSA in the prostate is up regulated by androgen, through the androgen receptor PSA was initially thought to be exclusively produced by prostate epithelial cells. However, there is now compelling evidence indicating that PSA is not prostate Specific. The major difference in PSA production between the prostate and other Tissues is that the amount produced by other tissues is comparatively much less.

PSA is present in low concentration in serum[ng/ml]. In sera PSA circulate in both Free and bound form, in seminal fluid the concentration range from 0.5 to 5 ng/ml, whereas the normal serum concentration in men aged 50-80 yrs with Prostate diseases is range between 1-4 ng/lit. PSA has large molecular weight, hence cleared from circulation mainly by liver than glomerular filtration. After removal of all prostate tissues from body the PSA has half life of 1-2 days.

AIMS & OBJECTIVES:

1.To know the usefulness of prostate specific antigen as a biomarker in carcinoma breast

2. To compare the level of serum prostate specific antigen in patients with carcinoma breast with normal standartised level and to compare the preoperative and postoperative serum PSA level in patients with carcinoma breast

MATERIALS AND METHODS

PLACE OF STUDY: Department of General Surgery,
Govt. Stanley Medical College and Hospital

DURATION: JAN 2014 TO SEP 2014

STUDY DESIGN: Comparitive study

SAMPLE SIZE : 50

INCLUSION CRITERIA:

Patients presenting with lump in the breast which proven to be carcinoma through tissue diagnosis.

EXCLUSION CRITERIA:

Patients with lump over breast which proven to be benign through tissue diagnosis and patients with associated ovarian and uterine pathology.

METHODOLOGY:

- Patients presenting with clinical features of lump in the breast, who has getting admission as in-patient in ward of our hospital from January 2014 to Sep 2014 will be enrolled in our study.

- Serum prostate specific antigen, sonographic study of breast, tissue diagnosis of lump will be done simultaneously.

- Serum prostate specific antigen level will be compared with normal standard level in patients proven to be carcinoma breast through tissue diagnosis.

- Serum prostate specific antigen will be measured at multiple occasions – preoperative, post neoaduvant and Postoperative and values are compared and analysed.

- Observations are tabulated according to the pre-designed proforma.

- The results are analyzed using Microsoft Excel for tabular transformation and graphical representation. For comparing the parameters, Chi Square test or Fischer's exact test are used. SPSS software will be used for statistical analysis.

OBSERVATION AND RESULTS

This study was conducted in the Department of General Surgery,Govt. Stanley Medical College & Hospital, Chennai for a period of one year. Patients ,who fulfilled the inclusion criteria ,were enrolled in this study, after obtaining an informed consent.

Total Number patients enrolled in the study – 50

Total Number of patients who underwent primarly surgery – 28

Total Number of patients who received neoadjuvant chemotherpy and underwent surgery- 22

Total Number of patients in postmenopausal age group- 32

Total Number of patients in premenopausal age group- 18

STATISTICAL ANALYSIS

Group Statistics

Table 1 One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
PSAPREMRMINngml	43	.293	.2272	.0346

Table 1 Std.deviatin and std .mean error

Table 2

One-Sample Test

	Test Value = 2					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PSAPREMRMINngml	-20.405	42	.000	-.7070	-.777	-.637

P < 0.01 value shows significant difference between mean value and expected level

Table 3

T-Test

Group Statistics

PN		N	Mean	Std. Deviation	Std. Error Mean
DIFF	pre Neoadjuvant	22	.086	.0560	.0119
	post neoadjuvant	28	.079	.0738	.0140

Table std.deviation and std.mean error of pre neoadjuvant and neoadjuvant

Table 4

Independent Samples Test

		Equality of Variances		t-test for Equality of Means						
									of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
DIFF	Equal variances assumed	4.125	.048	.411	48	.683	.0078	.0190	-.0304	.0460
	Equal variances not assumed			.424	47.959	.673	.0078	.0184	-.0291	.0447

P >0.01, no significant differences in PSA level between preneoadjuvant and neoaduvant

Fig.1 graphical discreption of mean differences

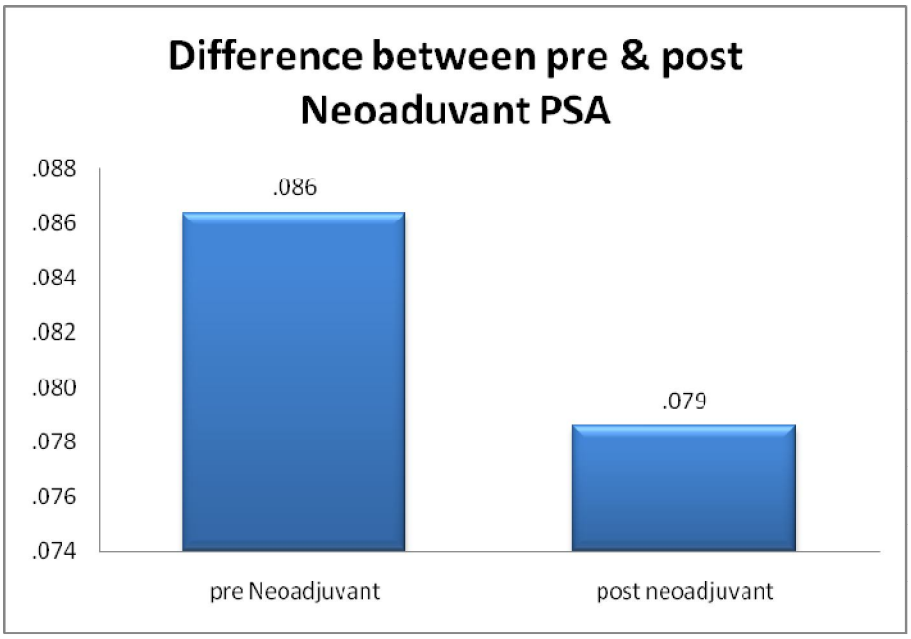


Table 5

Paired Samples Statistics[a]

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PSAPREMRMINngml	.375	28	.2335	.0441
	PSAPOSTMRMINmgml	.371	28	.2275	.0430

a. PN = Neo Adjuvant

Std.deviation and std.error of pre MRM and post MRM

Table 6

Paired Samples Test[a]

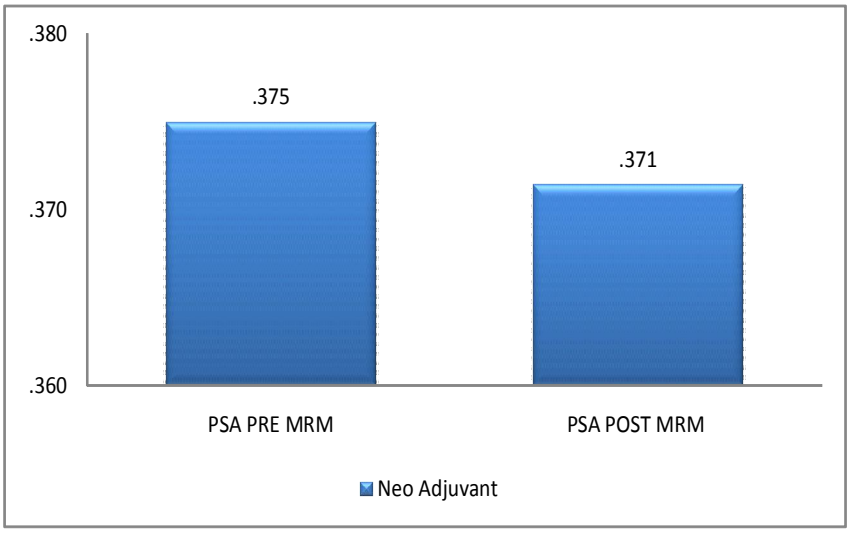
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	of the Difference Lower	of the Difference Upper			
Pair 1	PSAPREMRMINngml - PSAPOSTMRMINmgml	.0036	.1201	.0227	-.0430	.0502	.157	27	.876

a. PN = Neo Adjuvant

P>0.01, no significant differences between PSA level in pre MRM and post MRM

Fig 2

mean distribution between pre MRM and post MRM



DISCUSSION

Prostate specific antigen [PSA] is a tumor marker used widely for the diagnosis and monitoring of prostatic adenocarcinoma. Recent studies provided evidence that PSA may also be produced by breast tumor tissue.Study conducted at department of gynecology oncology, university of Turin, Italy showed that PSA concentration in the 200 breast cancer Patients ranged from 0 to 8.8 ng/mg with a median of 0.020 ng/mg. The PSA Positivity rate was 28% in the group of all cancer patients. 33% in patients under the age of 50 and 26% in patients at the age of 50 or older. PSA positive tumor were found in 34% of stage I, 24% of stage II, 18% of stage III and stage IV disease. These findings suggest that PSA production in these tissues may be regulated by mechanism which involve derangement of balance between the various steroid hormone and their receptors and also expression of non functional receptors or deranged post-receptor pathway.

Based on the information presented, PSA can now be regarded as a molecule Secreted by tissue in malignant diseases. Studies shown that PSA concentration in cytosal extract has a favourable prognostic indicator in breast cancer.

YU ET AL clinical studies shown that PSA in breast cancer is associated with Presence of progesterone receptor and patients with PSA-positive tumors have a lower risk of recurrence and death in comparison with patients whose tumors are PSA negative, thus PSA is a new candidate favourable prognostic indicator in female breast cancer. No study has yet been published examining whether serum PSA concentrations are higher in women with breast cancer than in healthy controls or whether the PSA levels in breast tumor affects the PSA concentration in the serum. Currently there is no established diagnostic value of PSA measurement in female serum. PSA is found in 60% of breast cancer cytosols, it is worthwile examining if PSA is also present in the serum of breast cancer patients and if the serum level have any clinical implication. This study conducted in an attempt to know, if serum PSA measurement in female serum have any diagnostic, prognostic or monitoring value. Serum PSA level of breast cancer patients were compared with standardized normal level and pre surgical and post surgical levels are also been compared.

SUMMARY

- Total Number patients enrolled in the study – 50
- Total Number of patients who underwent primarly surgery – 28
- Total Number of patients who received neoadjuvant chemotherpy and underwent surgery- 22
- Total Number of patients in postmenopausal age group- 32
- Total Number of patients in premenopausal age group- 18
- The Mean serum PSA level in patients with carcinoma breast was found very low when compared to expected level.
- The mean serum PSA level between pre-neoadjuvant and post- neoadjuvant has no significant differences
- The mean serum PSA level between pre- surgical and post surgical period has no significant differences.

CONCLUSION

This study conducted in an attempt to know, if serum PSA measurement in Female patients with carcinoma breast have any diagnostic, prognostic or monitoring value. Serum PSA level of breast cancer patients were compared with standardized normal level and pre surgical and post surgical levels are also been compared. After statistical ananlysis, the conclusion made that, there is no significant correlation between serum PSA level and carcinoma breast and no significant difference between Pre surgical and post surgical serum PSA level in patients with carcinoma breast. In prostate, PSA enters the circulation by physical diffusion.

Factors that affects the transport of PSA from tissue to blood may also be considered at this point and also the tumor behavior of the westerner and Asians may be considered for its significant change of PSA.

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PROFOMA

NAME: AGE: SEX:

ADDRESS:

OCCUPATION:

SOCIOECONOMIC STATUS:

RELIABILITY;

CHIEF COMPLAINT:

DURATION:

PRESENTING ILLNESS:

DURATION OF LUMP-

PAIN OVER LUMP-

NIPPLE DISCHARGE-

NIPPLE RETRACTION-

SKIN CHANGES-

PAST HISTORY:

FAMILY HISTORY:

PERSONAL HISTORY:

DRUG HISTORY:

GENERAL EXAMINATION:

HEAD TO FOOT

SYSTEMIC EXAMINATION:

CVS

RS

PA

CNS AND SPINE

P/R & P/V EXAMINATION

LOCAL EXAMINATIONS:

INSPECTION:

PALPATION:

LYMPH NODE EXAMINATION

STAGING:

DIAGNOSIS:

INVESTIGATIONS:

BLOOD INVESTIGATION

RADIOLOGICAL INVESTIGATION:

MAMMOGRAPHY:

USG BREAST:

FNAC:

CORE NEEDLE BIOPSY:

BONE SCAN:

Ra xg;Gjy; gbtk;

ஆராய்ச்சி நிலையம் - அரசு ஸ்டான்லி மருத்துவமனை, சென்னை.

ஆராய்ச்சி தலைப்பு - மார்பக புற்றுநோய் இரத்த மாதிரி பரிசோதனை

பெயர் -

வயது -

விலாசம் -

ஒப்புதல்

நான் _____ மார்பக புற்றுநோயின் காரணமாக இந்த மருத்துவமனையில் அனுமதிக்கப்பட்டுள்ளேன். மருத்துவர் மேற்கொள்ளவிருக்கும் ஆராய்ச்சி படிப்பை பற்றி எனக்கு விளக்கமாக எடுத்து கூறினார். இந்த ஆராய்ச்சிக்கு எனது இரத்த மாதிரி பரிசோதனை பதிவு ஏடுகளில் பதிவு பெறும் என்பதை அறிந்து இந்த ஆராய்ச்சிக்கு முழு மனதுடன் சம்மதிக்கிறேன்.

இடம் : நோயாளியின் கையொப்பம்

தேதி :

S.NO	NAME	AGE	SEX	IP.NO	DIAGNOSIS	STAGE	PRIMARY MRM	NEOADJUVANT	MENSTRUAL STAT	PSA PRE MRM IN n	PSA POST MRM IN ng/ml
1	PARIJATHAMALA	45	F	1405931	CA.LT.BREAST	T3N1M0		YES	POST MENOPAUS	0.5	0.6
2	BALKISH	51	F	1406501	CA.LT.BREAST	T2N1M0	YES		POST MENOPAUS	0.2	0.2
3	JERINA BEE	58	F	1406691	CA.LT.BREAST	T2N1M0	YES		POST MENOPAUS	0.1	0.2
4	JOTHY	40	F	1406725	CA.RT.BREAST	T3N1M0		YES	POAT MENOPAUS	0.1	ND
5	PANDIYAMMAL	53	F	1402566	CA.RT.BREAST	T2N1M0	YES		POST MENOPAUS	0.1	0.1
6	RADHA	35	F	151879	CA.RT.BREAST	T2N1M0	YES		PREMENOPAUSAL	0.7	0.6
7	SHENBAGAM	45	F	1406866	CA.RT.BREAST	T3N1M0		YES	PREMENOPAUSAL	ND	0.1
8	REVATHI	43	F	1407083	CA.LT.BREAST	T1N0M0	YES		PREMENOPAUSAL	0.2	0.4
9	KELAMBAL	70	F	53817	CA.RT.BREAST	T3N1M0		YES	POST MENOPAUS	ND	0.1
10	VASUGI	46	F	1407367	CA.LT.BREAST	T2N1M0	YES		PERIMENOAUSAL	0.4	0.5
11	SARASWATHI	48	F	7936	CA.LT.BREAST	T2N0M0	YES		POST MENOPAUS	0.2	0.2
12	ANITHA BANU	41	F	7947	CA.RT.BREAST	T3N1M0		YES	PERIMENOAUSAL	0.1	0.2
13	ARULVIZHI	30	F	64000	CA.RT.BREAST	T2N1M0	YES		PREMENOPAUSAL	0.8	0.6
14	NAVANEEDHAM	40	F	8747	CA.RT.BREAST	T1N0M0	YES		PREMENOPAUSAL	0.6	0.5
15	PRABHA	57	F	8743	CA.RT.BREAST	T3N1M0		YES	POST MENOPAUS	0.1	ND
16	JOTHY	50	F	18780	CA.LT.BREAST	T3N1M0		YES	POST MENOPAUS	0.1	ND
17	SASIKALA	57	F	18740	CA.RT.BREAST	T2N0M0	YES		POST MENOPAUS	0.1	0.2
18	VASANTHI	49	F	18940	CA.LT.BREAST	T3N1M0		YES	POST MENOPAUS	ND	0.1
19	GOWRI	55	F	19489	CA.LT.BREAST	T1N0M0	YES		POST MENOPAUS	0.1	0.1
20	KALAVATHI	37	F	11120	CA.LT.BREAST	T2N1M0	YES		PREMENOPAUSAL	0.7	0.8
21	SEENIAMMAL	60	F	1407930	CA.LT.BREAST	T3N1M0		YES	POST MENOPAUS	0.1	0.1
22	PANCHASARAM	62	F	12337	CA.RT.BREAST	T1N0M0	YES		POST MENOPAUS	0.2	0.1
23	CHINNAPONNU	35	F	12423	CA.LT.BREAST	T2N1M0	YES		PREMENOPAUSAL	0.6	0.7
24	YESUMANI	45	F	27641	CA.RT.BREAST	T3N1M0		YES	POST MENOPAUS	ND	ND
25	NIRMALA	40	F	27619	CA.RT.BREAST	T2N1M0	YES		PERIMENOAUSAL	0.5	0.3
26	SUSHILA	35	F	27664	CA.RT.BREAST	T2N1M0	YES		PREMENOPAUSAL	0.7	0.8
27	DEVI	35	F	27672	CA.LT.BREAST	T3N1M0		YES	PREMENOPAUSAL	0.1	0.3
28	JEYALAKSHMI	48	F	27672	CA.LT.BREAST	T2N1M0	YES		POST MENOPAUS	0.4	0.5
29	RADHA	50	F	29835	CA.LT.BREAST	T2N1M0	YES		POST MENOPAUS	0.2	0.2
30	DHANUSH	55	F	1415604	CA.LT.BREAST	T3N1M0		YES	POST MENOPAUS	ND	0.1
31	BHAGYALAKHMI	50	F	30515	CA.LT.BREAST	T1N0M0	YES		POST MENOPAUS	0.1	0.1
32	SAROJA	60	F	1430523	CA.LT.BREAST	T4N1M0		YES	POST MENOPAUS	0.1	0.1
33	VEERAMMAL	64	F	30544	CA.RT.BREAST	T2N0M0	YES		POST MENOPAUS	0.2	0.1
34	AMEENA	55	F	1425668	CA.LT.BREAST	T3N1M0		YES	POST MENOPAUS	ND	ND
35	KANNIYAMAL	48	F	1425706	CA.LT.BREAST	T2N1M0	YES		POST MENOPAUS	0.5	0.6
36	PANDIYAMMAL	42	F	31045	CA.RT.BREAST	T2N0M0	YES		PREMENOPAUSAL	0.4	0.2
37	MEENATCHI	49	F	32011	CA.RT.BREAST	T4N2M0		YES	POST MENOPAUS	0.1	0.1
38	SARASWATHI	48	F	21750	CA.LT.BREAST	T1N1M0	YES		POST MENOPAUS	0.4	0.5
39	PADMINI	51	F	21698	CA.LT.BREAST	T4N2M0		YES	POST MENOPAUS	0.1	0.1
40	MARIYAMMAL	38	F	1427370	CA.RT.BREAST	T2N0M0	YES		PREMENOPAUSAL	0.6	0.5
41	GOVINDAMAL	40	F	1427628	CA.RT.BREAST	T3N1M0		YES	PERIMENOAUSAL	0.1	ND
42	PRABHA	57	F	101714	CA.RT.BREAST	T2N0M0	YES		POST MENOPAUS	0.2	0.4
43	ANJA	37	F	1438143	CA.RT.BREAST	T3N1M0		YES	PREMENOPAUSAL	0.1	0.1
44	LAKSHMI	38	F	1438311	CA.LT.BREAST	T2N1M0	YES		PREMENOPAUSAL	0.5	0.3
45	MUNIAMAL	54	F	39063	CA.RT.BREAST	T4N2M0		YES	POST MENOPAUS	0.1	0.1
46	PREMA	53	F	8118	CA.RT.BREAST	T4N2M0		YES	POST MENOPAUS	0.2	0.1
47	VISALATCHI	45	F	10514	CA.RT.BREAST	T2N1M0	YES		POST MENOPAUS	0.7	0.6
48	SAMPOORNAM	70	F	14183	CA.LT.BREAST	T2N1M0	YES		POST MENOPAUS	0.1	0.1
49	RAJAMAL	52	F	26628	CA.LT.BREAST	T3N1M0		YES	POST MENOPAUS	ND	ND
50	SOKAMAL	64	F	1401034	CA.RT.BREAST	T4NM0		YES	POST MENOPAUS	0.2	0.1